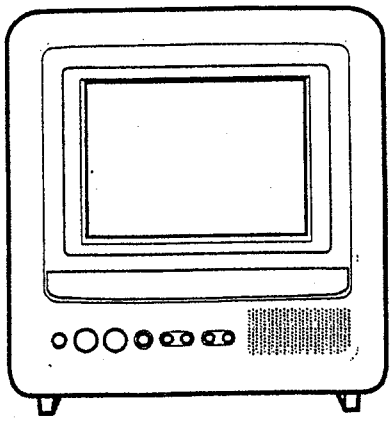
Service Manual

ORION

Combi 600 LCD

LCD Color Television / Video Cassette Recorder



VHS PAL

Chassis Code:

A

Bestell-Nr.:

8051

SPECIFICATIONS

(TV SECTION)

PICTURE SIZE:	6 inch
SYSTEM:	PAL B/G
FREQUENCY RANGE	
VHF (L):	E2-S7 ch
VHF (H):	S8-S36 ch
UHF:	S37-69 ch
INTERMEDIATE FREQUENCY	
Picture IF Carrier Frequency:	38.9 MHz
Color Sub Carrier Frequency:	34.47 MHz
Sound IF Carrier Frequency:	33.4 MHz
SOUND INTERMEDIATE FREQUENCY:	5.5 MHz
MAXIMUM OUTPUT POWER:	1.5 W
10% THD OUTPUT POWER:	1.0 W
SPEAKER:	8 ohm× 1
POWER SOURCE:	AC 230V/50Hz DC 12V

(VCR SECTION)

VIDEO RECORDING SYSTEM:	VHS, 2 rotary heads helical scanning system Luminance : FM azimuth recording Color signal : converted sub-carrier
AUDIO TRACK:	1 track
TAPE FORMAT:	12.65 mm high density tape
TAPE SPEED:	NTSC or PAL-M SP : 33.35 mm/sec PAL or SECAM SP : 23.39 mm/sec
TEMPERATURE:	Operation : 5℃ to 40℃ Storage : -20℃ to 60℃
F.FWD/REW TIME:	Approx.3 minutes 30 seconds (With E-180 Cassette Tape)
INPUT LEVEL:	Video : VIDEO IN socket 1.0Vp-p, 75 ohm unbalanced Audio : AUDIO IN socket 300mV, 50K ohm unbalanced
OUTPUT LEVEL:	Video : VIDEO OUT socket 1.0Vp-p, 75 ohm unbalanced Audio : AUDIO OUT socket 390mV, 1K ohm unbalanced
WEIGHT:	3.4 Kg
DIMENSIONS:	240(W) X 120(D) X 240(H) mm

Design and specifications are subject to change without notice.

SERVICING NOTICES ON CHECKING

1. KEEP THE NOTICES

As for the places which need special attentions, they are indicated with the labels or seals on the cabinet, chassis and parts. Make sure to keep the indications and notices in the operation manual.

2. AVOID AN ELECTRIC SHOCK

There is a high voltage part inside. Avoid an electric shock while the electric current is flowing.

3. USE THE DESIGNATED PARTS

The parts in this equipment have the specific characters of incombustibility and withstand voltage for safety. Therefore, the part which is replaced should be used the part which has the same character.
Especially as to the important parts for safety which is indicated in the circuit diagram or the table of parts as a ⚠ mark, the designated parts must be used.

4. PUT PARTS AND WIRES IN THE ORIGINAL POSITION AFTER ASSEMBLING OR WIRING

There are parts which use the insulation material such as a tube or tape for safety, or which are assembled in the condition that these do not contact with the printed board. The inside wiring is designed not to get closer to the pyrogenic parts and high voltage parts. Therefore, put these parts in the original positions.

5. TAKE CARE TO DEAL WITH THE CATHODE-RAY TUBE

In the condition that an explosion-proof cathode-ray tube is set in this equipment, safety is secured against implosion. However, when removing it or serving from backward, it is dangerous to give a shock. Take enough care to deal with it.

6. AVOID AN X-RAY

Safety is secured against an X-ray by considering about the cathode-ray tube and the high voltage
peripheral circuit, etc.
Therefore, when repairing the high voltage peripheral circuit, use the designated parts and make sure not modify the circuit.
Repairing except indicates causes rising of high voltage, and it emits an X-ray from the cathode-ray tube.

7. PERFORM A SAFETY CHECK AFTER SERVICING

Confirm that the screws, parts and wiring which were removed in order to service are put in the original positions, or whether there are the portions which are deteriorated around the serviced places serviced or not. Check the insulation between the antenna terminal or external metal and the AC cord plug blades. And be sure the safety of that.

(INSULATION CHECK PROCEDURE)

1. Unplug the plug from the AC outlet.
2. Remove the antenna terminal on TV and turn on the TV.
3. Insulation resistance between the cord plug terminals and the eternal exposure metal **[Note 2]** should be more than 1M ohm by using the 500V insulation resistance meter **[Note 1]**.
4. If the insulation resistance is less than 1M ohm, the inspection repair should be required.

[Note 1]

If you have not the 500V insulation resistance meter, use a Tester.

[Note 2]

External exposure metal: Antenna terminal
Earphone jack

HOW TO ORDER PARTS

Please include the following informations when you order parts. (Particularly the CHASSIS CODE.)

1. MODEL NUMBER and CHASSIS CODE
   You can find it in the back of your unit.
2. PART NO. and DESCRIPTION
   You can find it in your SERVICE MANUAL.

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DISASSEMBLY INSTRUCTIONS

1. REMOVAL OF MECHANICAL PARTS AND P.C. BOARDS

1-1: BACK CABINET AND CASSETTE LID ASSS'Y (Refer to Fig. 1-1)

1. Remove the 2 screws ①.
2. Remove the Cassette Lid Ass'y.
3. Remove the 10 screws ②.
4. Remove the Back Cabinet.
5. Disconnect the following connector: (CP1005 4 pins)

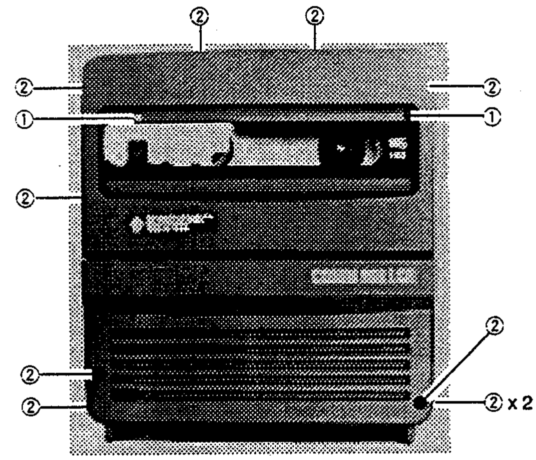


Fig. 1-1

1-2: BACK CABINET ASS'Y AND BATTERY PCB (Refer to Fig. 1-2)

1. Remove the 2 screws ①.
2. Remove the Back Cabinet Ass'y.
3. Remove the 2 screws ②.
4. Remove the Battery PCB.

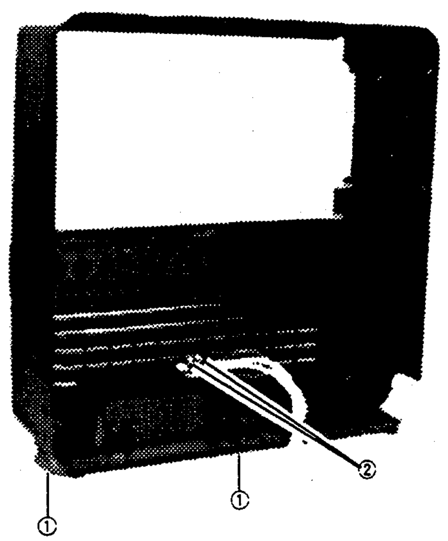


Fig. 1-2

1-3: TOP LOADING AND CHASSIS SECTION (Refer to Fig. 1-3-A)

1. Remove the 4 screws ①.
2. Remove the Top Loading.
3. Remove the 6 screws ②.
4. Remove the Chassis Section.

NOTE

When installing the Top Loading, align the timing marks. (Refer to Fig. 1-3-B)

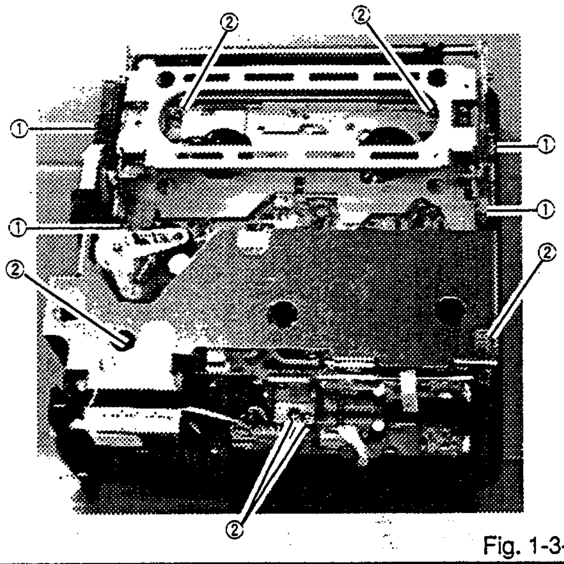


Fig. 1-3-A

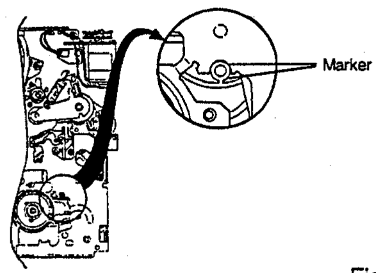


Fig. 1-3-B

1-4: DECK HOLDER AND MAIN PCB (Refer to Fig. 1-4)

1. Disconnect the following connector: (CP1001 12 pins, CP1002 8 pins and CP1004 12 pins)
2. Remove the 3 screws ①.
3. Remove the Deck Holder.
4. Remove the screw ②.
5. Remove the Main PCB.

DISASSEMBLY INSTRUCTIONS

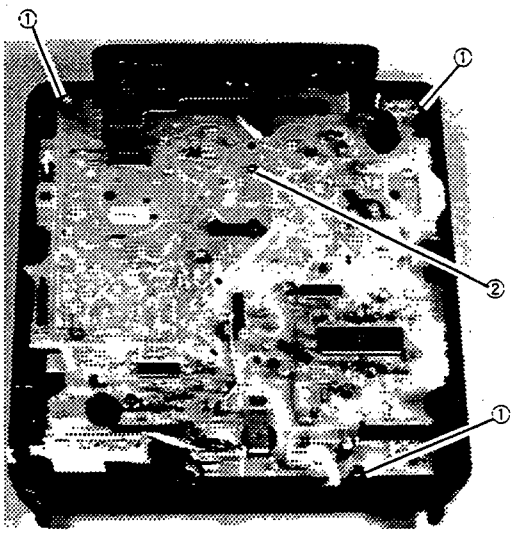


Fig. 1-4

1-5: LCD PCB AND JACK PLATE (Refer to Fig. 1-5)

1. Remove the 8 screws ①.
2. Remove the LCD PCB and Jack Plate.

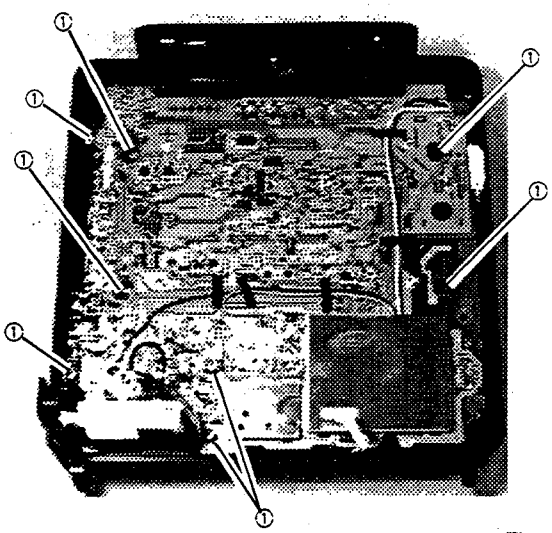


Fig. 1-5

1-6: LCD BLOCK (Refer to Fig. 1-7)

1. Disconnect the following connector: (CP7001 24 pins and CP4502 2 pins)
   (When removing, pull the position (A) and when installing, push the position (A), as illustrated in Fig. 1-6.)
2. Remove the 4 screws ①.
3. Remove the 2 screws ②.
4. Remove the LCD Block.

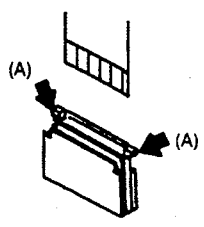


Fig. 1-6

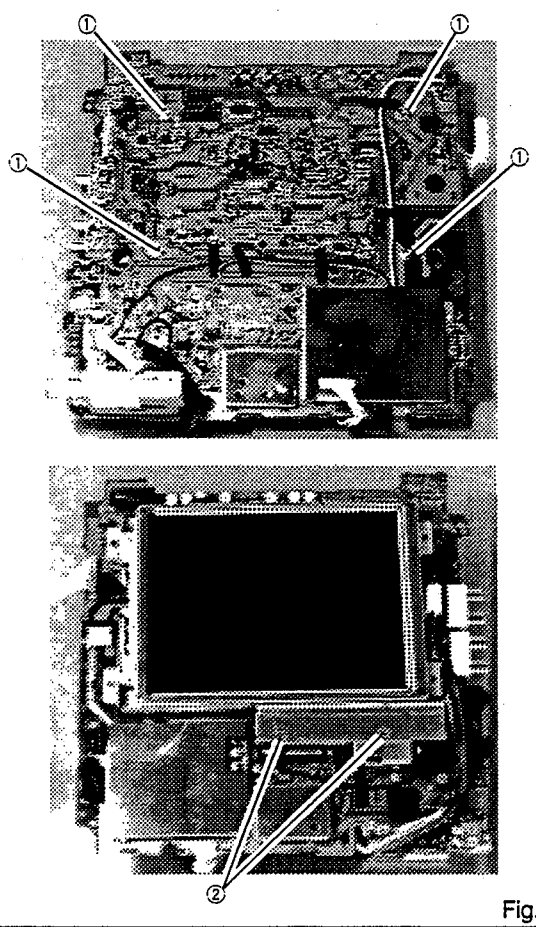


Fig. 1-7

1-8: OPERATION PCB (Refer to Fig. 1-8)

1. Remove the 4 screws ①.
2. Remove the Operation PCB.
3. Disconnect the following connector: (CP701 2 pins)

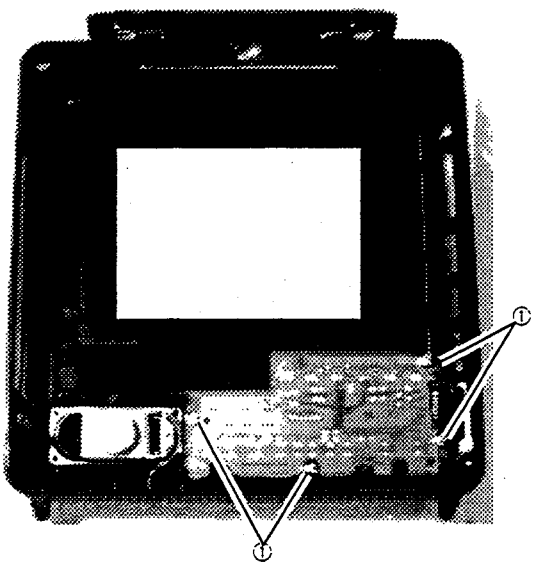


Fig. 1-8

DISASSEMBLY INSTRUCTIONS

1-9: LOCATION OF PRINTED CIRCUIT BOARDS.
(Refer to Fig. 1-9)

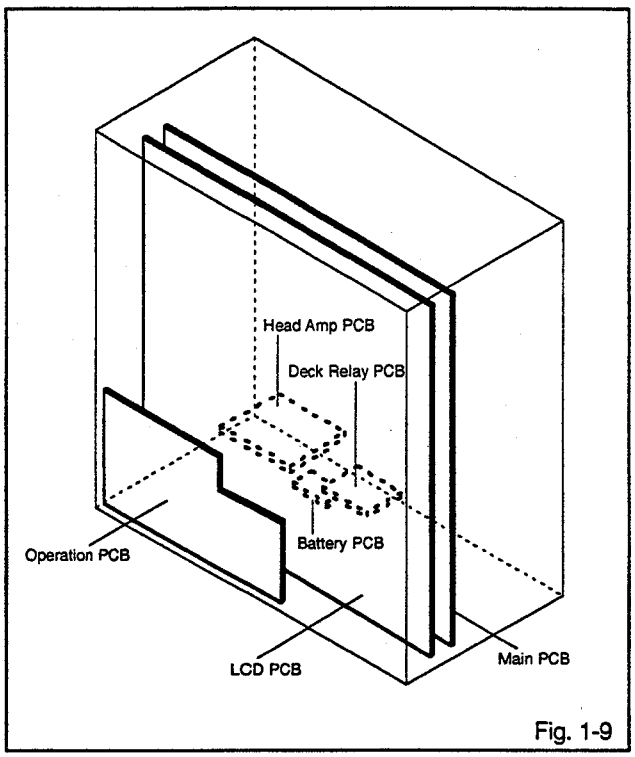


Fig. 1-9

DISASSEMBLY INSTRUCTIONS

2. REMOVAL OF DECK PARTS

2-1: BRAKE BRACKET (Refer to Fig. 2-1)

1. Remove the Main Brake Spring, S-S Brake Spring, Joint Arm Spring, T-S Brake Spring, Tension Lever Spring 3 and and Tension Arm Spring 3.
2. Remove the 2 screws ①.
3. Remove the screw ②.
4. Remove the Brake Bracket.
5. Remove the Sub Brake S, Sub Brake T, Main Brake S Ass'y, Main Brake T Ass'y and Tension Lever 3.
6. Remove the Joint Arm.
7. Remove the Reflector LED.
8. Remove the E-Ring.
9. Remove the Tension Arm 3 Ass'y.

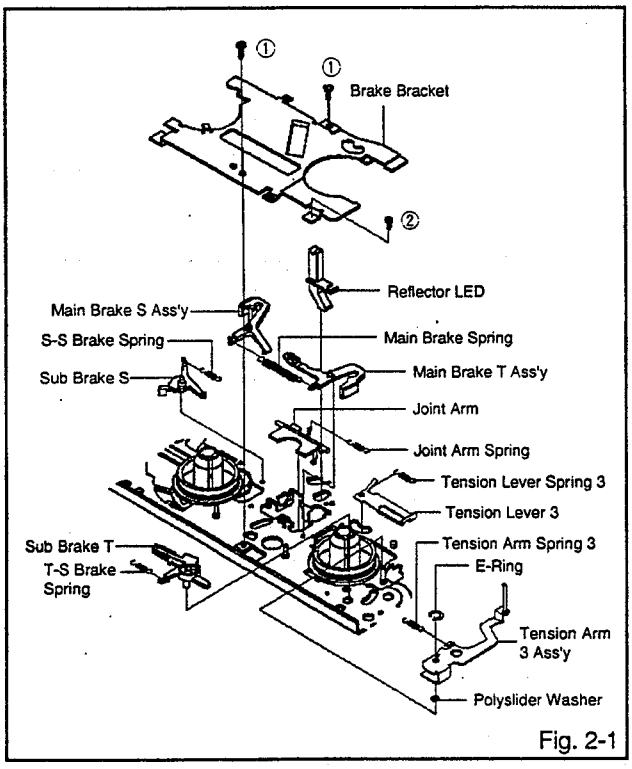


Fig. 2-1

2-2: TENSION BAND (Refer to Fig. 2-2)

1. Remove the Tension Arm Spring 1.
2. Remove the Tension Arm Spring 2.
3. Remove the Tension Adjust.
4. Remove the Tension Arm Ass'y.
5. Remove the Tension Band Ass'y.
6. Remove the Tension Lever 2 Ass'y.

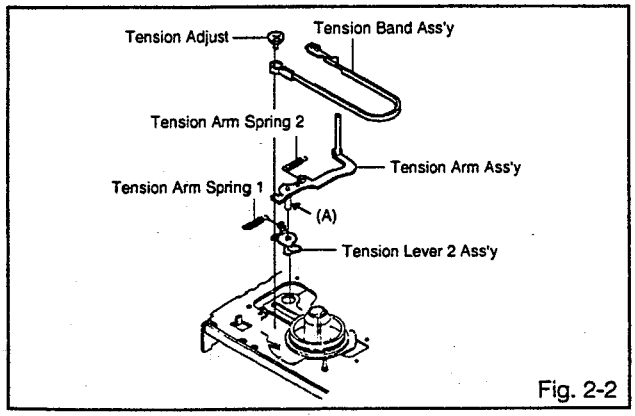


Fig. 2-2

NOTES

1. Install the Tension Band Ass'y without twisting it.
2. Turbine Oil (Lubricating Grade #150) the area marked with A in **Fig. 2-2.**

EX: KYOUDO Oil Sulaidasu #150
IDEMITSU Oil Supper Multi #150

2-3: REEL DISK (Refer to Fig. 2-3)

1. Remove the Reel Disk S and Reel Disk T.
2. Remove the 2 polyslider washers.

NOTES

1. Install the Reel Disk after performing steps 1, 2 and 3 in section 2-2 of Disassembly Instructions.
2. The Height Adjustment washers are sometimes attached to the back of the Reel Disk.
3. Clean the Reel Disk Shaft and put in height adjusting washers.
4. Be careful not to damage the Tension Band Ass'y at the time of removal and installation.
5. Be careful not to scratch the Reel Disk Shaft with the polyslider washer or the tool at the time of removal and installation.
6. After oiling (Lubricating Grade #150) the Reel Disk Shaft, install the new Reel Disk S and Reel Disk T again.

EX: KYOUDO Oil Sulaidasu #150
IDEMITSU Oil Supper Multi #150

7. After installation, adjust the height of the Reel Disk. **(Refer to item 1-1 of MECHANICAL ADJUSTMENTS)**
8. After installation, adjust and confirm the tension post position. **(Refer to item 1-2 of MECHANICAL ADJUSTMENTS)**

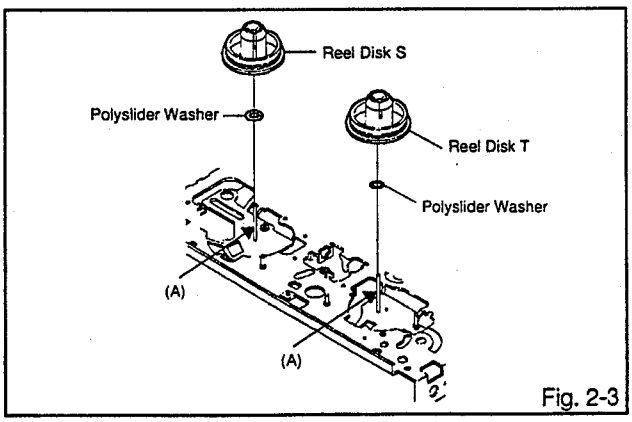


Fig. 2-3

2-4: PINCH ROLLER / CASSETTE OPENER (Refer to Fig. 2-4)

1. Unlock the support ①.
2. Remove the Pinch Roller.
3. Remove the screw ②.
4. Unlock the 2 supports ③.
5. Remove the Cassette Opener.
6. Remove the Spring P5 and Arm P5 Ass'y.
7. Remove the Cam Gear and Cam Pinch Roller.
8. Remove the polyslider washer and Cam P5.

NOTES

1. Do not touch the Pinch Roller. (Use gloves.)
2. When installing the Cam P5, Cam Pinch Roller and Cam Gear, align the timing marks.

DISASSEMBLY INSTRUCTIONS

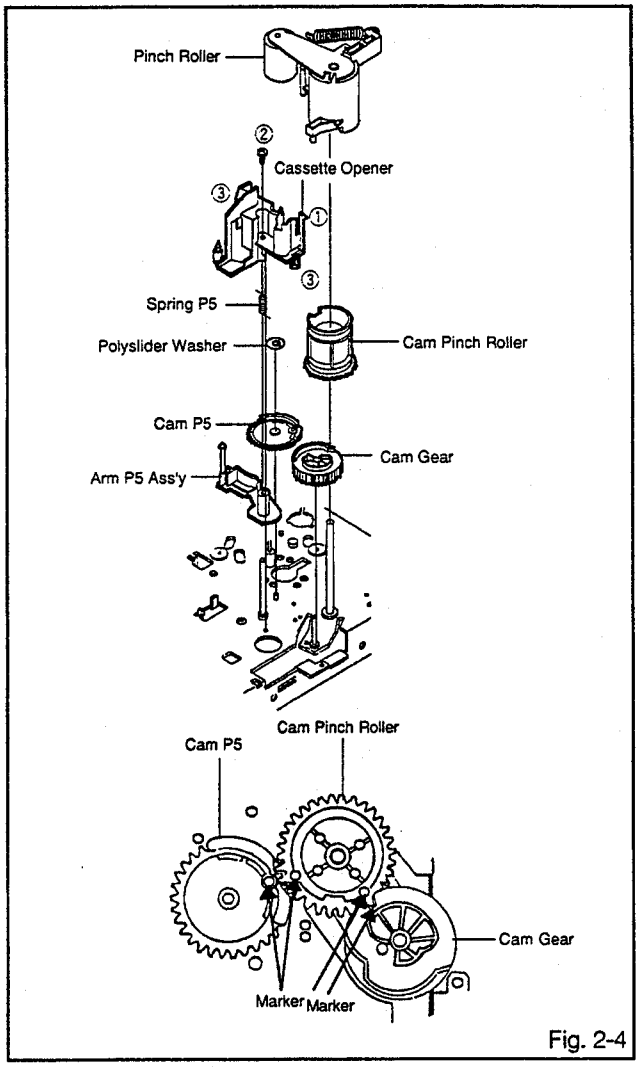


Fig. 2-4

2-5: AUDIO CONTROL HEAD (Refer to Fig. 2-5)

1. Disconnect the connector: (CX4001 6 pins) on the Audio Control Head PCB.
2. Remove the 3 screws ①.
3. Remove the 3 Audio Control Head Springs.
4. Remove the Audio Control Head.

NOTES

1. Do not touch the head by any means when replacing the Audio Control Head. (Use gloves.)
2. After replacement, confirm the following adjustments.
   a. MECHANICAL ADJUSTMENTS: ITEM 2-2
   b. MECHANICAL ADJUSTMENTS: ITEM 2-3

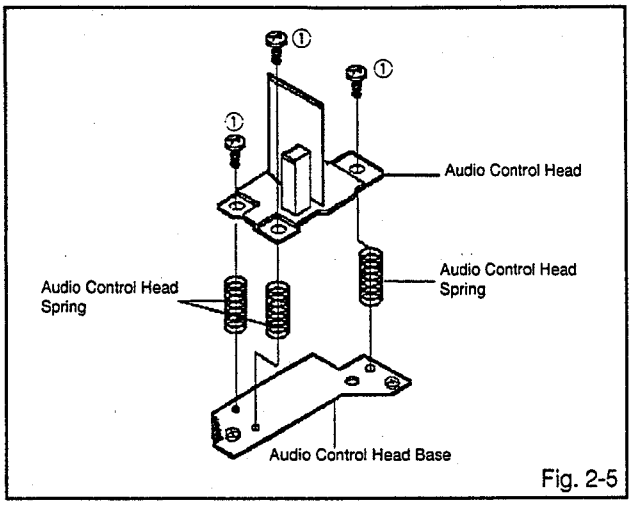


Fig. 2-5

2-6: CYLINDER UNIT (Refer to Fig. 2-6)

1. Disconnect the following connectors: (CP4101 4 pins and CP4102 5 pins).
2. Remove the Joint Screw, then remove the Azimuth Spring.
3. Remove the 2 screws ①, then remove the Polyslider Washer and Cylinder Unit from the Main Chassis.

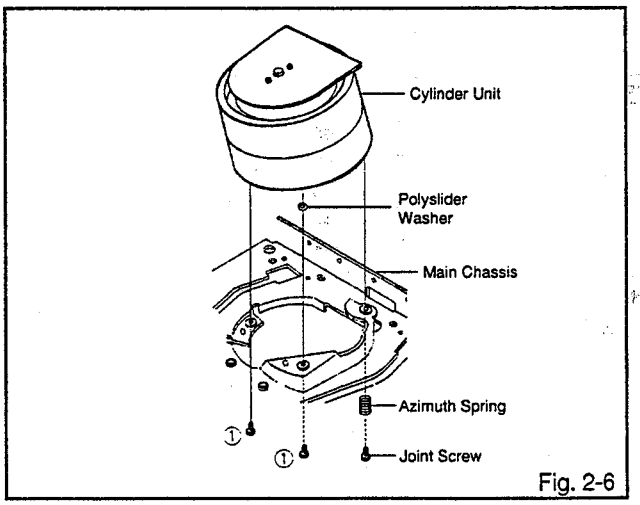


Fig. 2-6

2-7: PLATE BOTTOM (Refer to Fig. 2-7)

1. Remove the Capstan Belt.
2. Remove the 2 screws ①.
3. Remove the 3 screws ②.
4. Remove the Mode Switch.
5. Remove the Tension Lever Spring.
6. Remove the Plate Bottom.

NOTE

When installing the Mode SW, align the timing position.

DISASSEMBLY INSTRUCTIONS

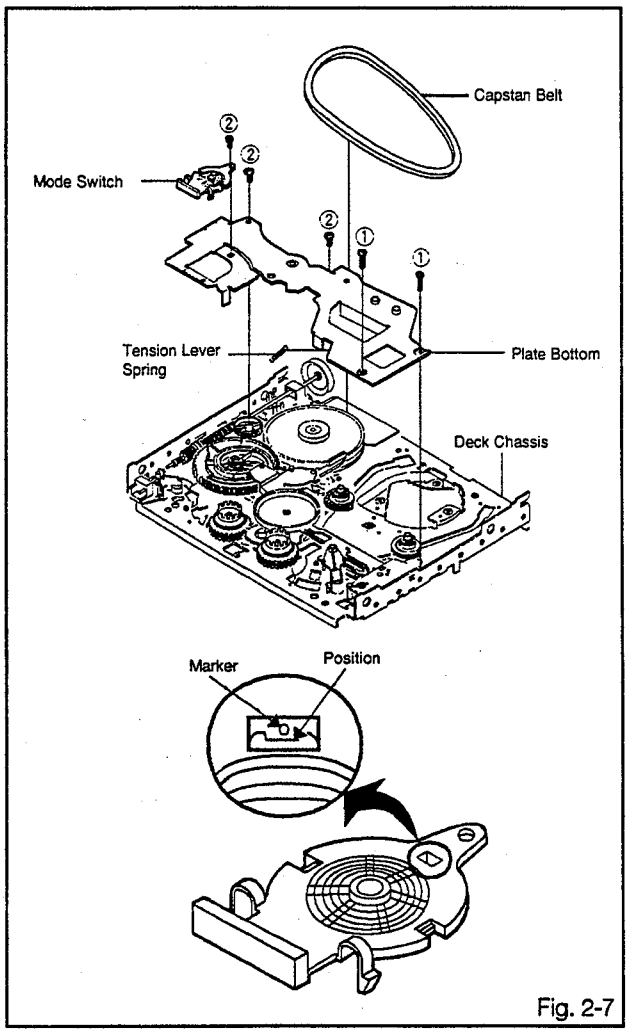


Fig. 2-7

2-8: CENTER PULLEY (Refer to Fig. 2-8)

1. Remove the polyslider washer ①.
2. Remove the Center Pulley.
3. Remove the polyslider washer ②.
4. Remove the Center Pulley Spring.
5. Remove the Idler Arm Ass'y.
6. Remove the 2 polyslider washers ③.
7. Remove the Clutch Gear T Ass'y and Clutch Gear S Ass'y.

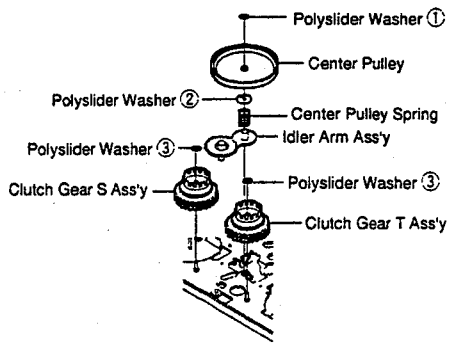


Fig. 2-8

2-9: MAIN CAM (Refer to Fig. 2-9)

1. Remove the Loading Lever.
2. Remove the Main Brake Lever.
3. Remove the Capstan Brake Spring.
4. Remove the Capstan Brake Ass'y.
5. Remove the Main Rod Spring.
6. Remove the Tension Holder.
7. Remove the Tension Lever.
8. Remove the Main Cam.
9. Remove the Middle Gear.
10. Remove the Tension Pinion 3.
11. Remove the Main Rod Ass'y.

NOTES

1. When installing the Main Rod Ass'y, install side (B) first, then install side (A).
2. When installing the Loading Lever, align the timing marks.

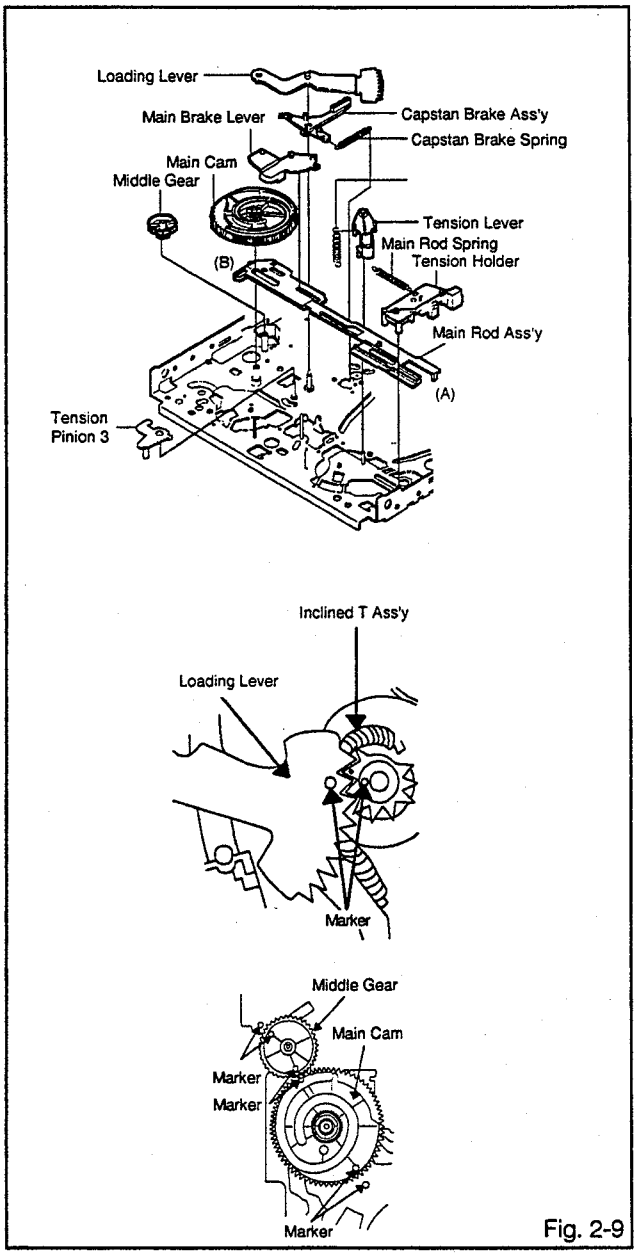


Fig. 2-9

DISASSEMBLY INSTRUCTIONS

2-10:CAPSTAN DD UNIT (Refer to Fig. 2-10)

1. Remove the screw ①.
2. Remove the screw ②.
3. Disconnect the CX4003 9 pins.
4. Remove the Deck Relay PCB.
5. Remove the 3 screws ③.
6. Remove the Capstan DD Unit.

NOTE

Use the specified screw to hold the Capstan DD Unit.

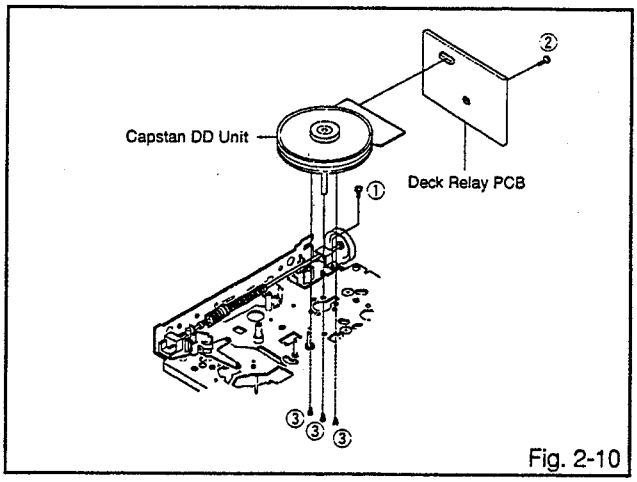


Fig. 2-10

2-11: INCLINED T ASS'Y / INCLINED S ASS'Y (Refer to Fig. 2-11)

1. Remove the 2 CS-Rings.
2. Remove the Inclined T Ass'y and Inclined S Ass'y.
3. Remove the Loading Gear T Ass'y.
4. Remove the Loading Gear S Ass'y.

NOTE

When installing the Inclined T Ass'y and Inclined S Ass'y, align the timing marks.

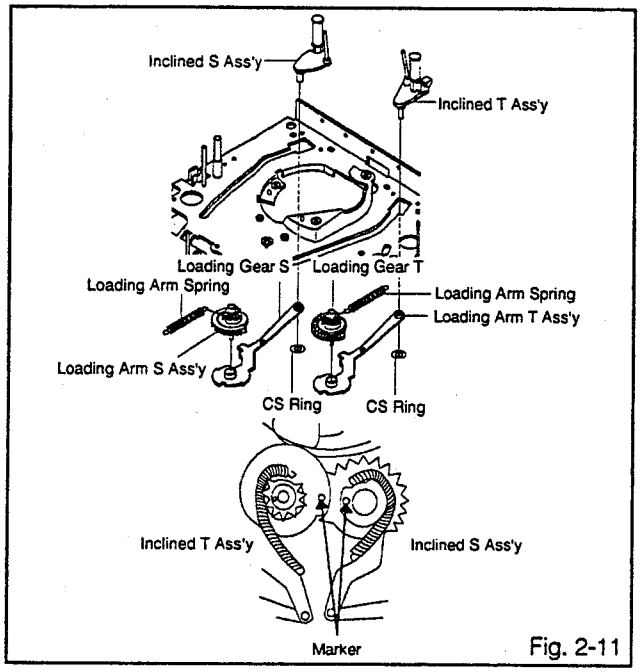


Fig. 2-11

KEY TO ABBREVIATIONS

A	A/C	:	Audio/Control
	ACC	:	Automatic Color Control
	AE	:	Audio Erase
	AFC	:	Automatic Frequency Control
	AFT	:	Automatic Fine Tuning
	AFT DET	:	Automatic Fine Tuning Detect
	AGC	:	Automatic Gain Control
	AMP	:	Amplifier
	ANT	:	Antenna
	A.PB	:	Audio Playback
	APC	:	Automatic Phase Control
	ASS'Y	:	Assembly
	AT	:	All Time
	AUTO	:	Automatic
	A/V	:	Audio/Video
B	BGP	:	Burst Gate Pulse
	BOT	:	Beginning of Tape
	BPF	:	Bandpass Filter
	BRAKE SOL	:	Brake Solenoid
	BUFF	:	Buffer
	B/W	:	Black and White
C	C	:	Capacitance, Collector
	CASE	:	Cassette
	CAP	:	Capstan
	CARR	:	Carrier
	CH	:	Channel
	CLK	:	Clock
	CLOCK (SY-SE)	:	Clock (Syscon to Servo)
	COMB	:	Combination, Comb Filter
	CONV	:	Converter
	CPM	:	Capstan Motor
	CTL	:	Control
	CYL	:	Cylinder
	CYL-M	:	Cylinder-Motor
	CYL SENS	:	Cylinder-Sensor
D	DATA (SY-CE)	:	Data (Syscon to Servo)
	dB	:	Decibel
	DC	:	Direct Current
	DD Unit	:	Direct Drive Motor Unit
	DEMOD	:	Demodulator
	DET	:	Detector
	DEV	:	Deviation
E	E	:	Emitter
	EF	:	Emitter Follower
	EMPH	:	Emphasis
	ENC	:	Encoder
	ENV	:	Envelope
	EOT	:	End of Tape
	EQ	:	Equalizer
	EXT	:	External
F	F	:	Fuse
	FBC	:	Feed Back Clamp
	FE	:	Full Erase
	FF	:	Fast Forward, Flipflop
	FG	:	Frequency Generator
	FL SW	:	Front Loading Switch
	FM	:	Frequency Modulation
	FSC	:	Frequency Sub Carrier
	FWD	:	Forward
G	GEN	:	Generator
	GND	:	Ground
H	H.P.F	:	High Pass Filter
	H.SW	:	Head Switch
	Hz	:	Hertz
I	IC	:	Integrated Circuit
	IF	:	Intermediate Frequency
	IND	:	Indicator
	INV	:	Inverter
K	KIL	:	Killer
L	L	:	Left
	LCD	:	Liquid Crystal Display
	LED	:	Light Emitting Diode
	LIMIT AMP	:	Limiter Amplifier
	LM, LDM	:	Loading Motor
	LP	:	Long Play
	L.P.F	:	Low Pass Filter
	LUMI.	:	Luminance
M	M	:	Motor
	MAX	:	Maximum
	MINI	:	Minimum
	MIX	:	Mixer, mixing
	MM	:	Monostable Multivibrator
	MOD	:	Modulator, Modulation
	MPX	:	Multiplexer, Multiplex
N	NC	:	Non Connection
	NR	:	Noise Reduction
O	OSC	:	Oscillator
	OPE	:	Operation
P	PB	:	Playback
	PB CTL	:	Playback Control
	PB-C	:	Playback-Chrominance
	PB-Y	:	Playback-Luminance
	PCB	:	Printed Circuit Board
	P. CON	:	Power Control
	PD	:	Phase Detector
	PG	:	Pulse Generator
	P-P	:	Peak-to Peak
R	R	:	Right
	REC	:	Recording
	REC-C	:	Recording-Chrominance
	REC-Y	:	Recording-Luminance
	REEL BRK	:	Reel Brake
	REEL S	:	Reel Sensor
	REF	:	Reference
	REG	:	Regulated, Regulator
	REW	:	Rewind
	REV, RVS	:	Reverse
	RF	:	Radio Frequency
	RMC	:	Remote Control
	RY	:	Relay
S	S. CLK	:	Serial Clock
	S. COM	:	Sensor Common
	S. DATA	:	Serial Data
	SEG	:	Segment
	SEL	:	Select, Selector
	SENS	:	Sensor
	SER	:	Search Mode
	SI	:	Serial Input
	SIF	:	Sound Intermediate Frequency
	SO	:	Serial Output
	SOL	:	Solenoid
	SP	:	Standard Play
	STB	:	Serial Strobe
	SW	:	Switch

KEY TO ABBREVIATIONS

S	**SYNC**	:	Synchronization
	SYNC SEP	:	Sync Separator, Separation
T	**TR**	:	Transistor
	TRAC	:	Tracking
	TRICK PB	:	Trick Playback
	TP	:	Test Point
U	**UNREG**	:	Unregulated
V	**V**	:	Volt
	VCO	:	Voltage Controlled Oscillator
	VIF	:	Video Intermediate Frequency
	VP	:	Vertical Pulse, Voltage Display
	V.PB	:	Video Playback
	VR	:	Variable Resistor
	V.REC	:	Video Recording
	VSF	:	Visual Search Fast Forward
	VSR	:	Visual Search Rewind
	VSS	:	Voltage Super Source
	V-SYNC	:	Vertical-Synchronization
	VT	:	Voltage Tuning
X	**X'TAL**	:	Crystal
Y	**Y/C**	:	Luminance/Chrominance

PREVENTIVE CHECKS AND SERVICE INTERVALS

The following standard table depends on environmental conditions and usage. Unless maintenance is properly carried out, the following service intervals may be quite shortened as harmful effects may be had on other parts. Also, long term storage or misuse may cause transformation and aging of rubber parts.

Time / Parts Name	500 hours	1,000 hours	1,500 hours	2,000 hours	3,000 hours	Notes
Audio Control Head	■	■	■	■	■	Clean those parts in contact with the tape.
Full Erase Head	■	■	■	■	■	
Loading Motor Belt		■		●		Clean the rubber, and parts which the rubber touches.
Reel Belt		■		●		
Pinch Roller	■	■	■	■	■ ●	
Capstan DD Unit					●	
Loading Motor					●	
Tension Band					●	
Capstan Shaft	■	■	■	■	■	
Tape Running Guide Post	■	■	■	■	■	Replace when rolling becomes abnormal.
Cylinder Unit	■	■ ●	■	■ ●	■ ●	Clean the Head.

● : Replace ■ : Clean

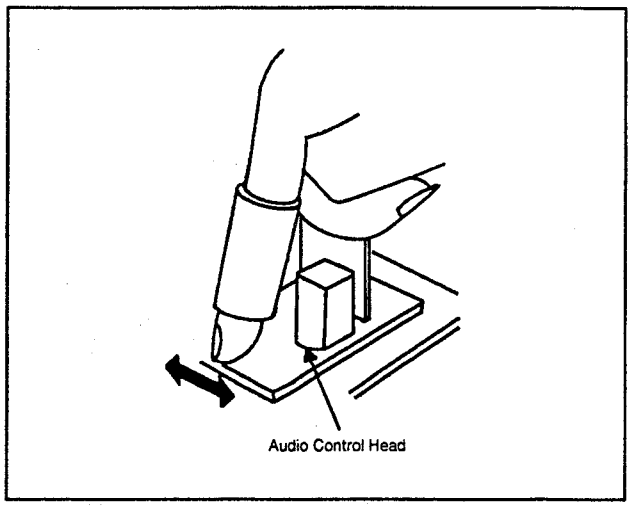
CLEANING

NOTE

- After cleaning the heads with isopropyl alcohol, do not run a tape until the heads dry completely. If the heads are not completely dry and alcohol gets on the tape, damage may occur.

1. AUDIO CONTROL HEAD

- Wrap a piece of chamois around your finger. Dip it in isopropyl alcohol and clean the audio control head by wiping it horizontally. Clean the full erase head in the same manner. **(Refer to the figure below)**



2. TAPE RUNNING SYSTEM

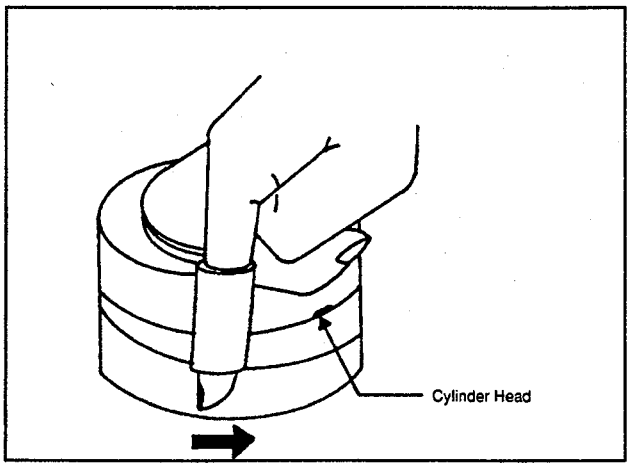
- When cleaning the tape transport system, use the gauze moistened with isopropyl alcohol.

3. CYLINDER

- Wrap a piece of chamois around your finger. Dip it in isopropyl alcohol. Hold it to the cylinder head softly. Turn the cylinder head counterclockwise to clean it (in the direction of the arrow). **(Refer to the figure below)**

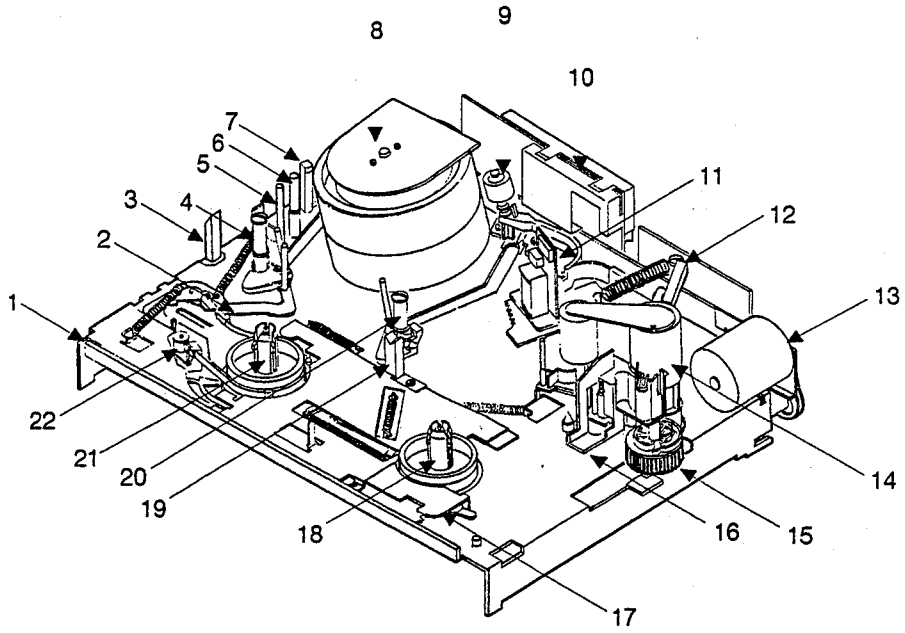
NOTE

Do not exert force against the cylinder head. Do not move the chamois up or down since this can damage the head. Always use a piece of chamois for cleaning.



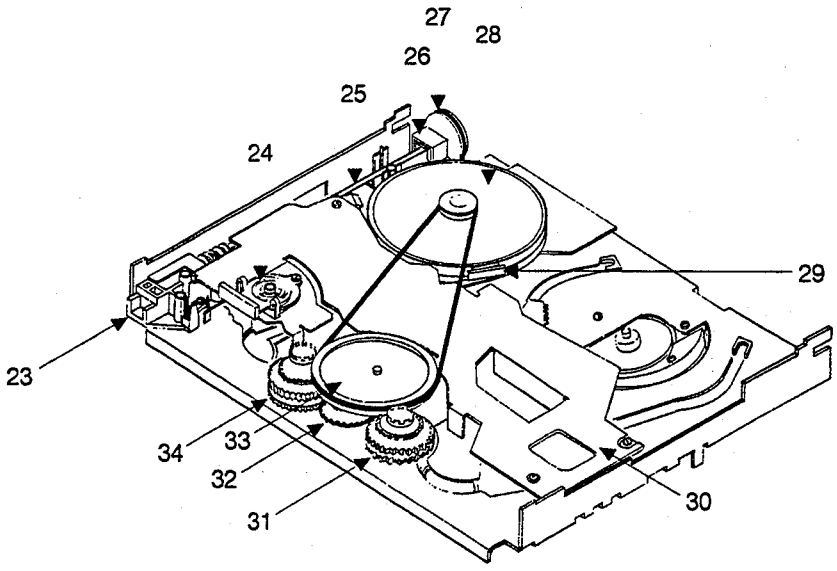
DECK PARTS LOCATIONS

(TOP VIEW)



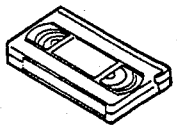
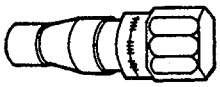
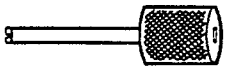
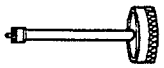
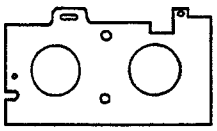
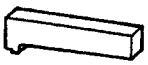
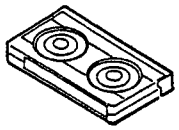
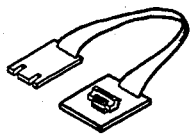
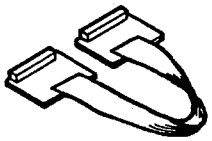
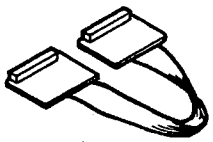
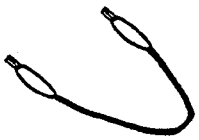
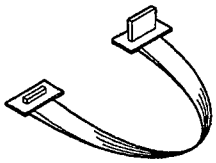
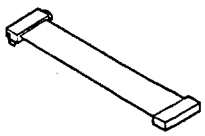
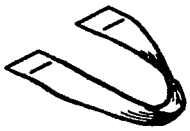
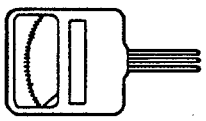
1. Main Chassis
2. Tension Arm Ass'y
3. EOT Reflector
4. Guide Roller S Ass'y
5. P0 Post
6. P1 Post
7. FE Head
8. Cylinder Unit
9. Auto Head Cleaning
10. Head Amp PCB
11. Audio/Control Head
12. Deck Relay PCB
13. Loading Motor
14. Pinch Roller Block
15. Cam Gear
16. Cassette Opener
17. Brake Bracket
18. Reel
19. LED Reflector
20. Guide Roller T Ass'y
21. Reel
22. Tension Band Ass'y

(BOTTOM VIEW)



23. Worm Bracket F Ass'y
24. Mode Switch
25. Worm Ass'y
26. Worm Bracket R Ass'y
27. Loading Motor Belt
28. Capstan DD Unit
29. Capstan Brake Ass'y
30. Bottom Plate
31. Clutch Gear S Ass'y
32. Idler Arm Ass'y
33. Center Pulley
34. Clutch Gear T Ass'y

SERVICING FIXTURES AND TOOLS

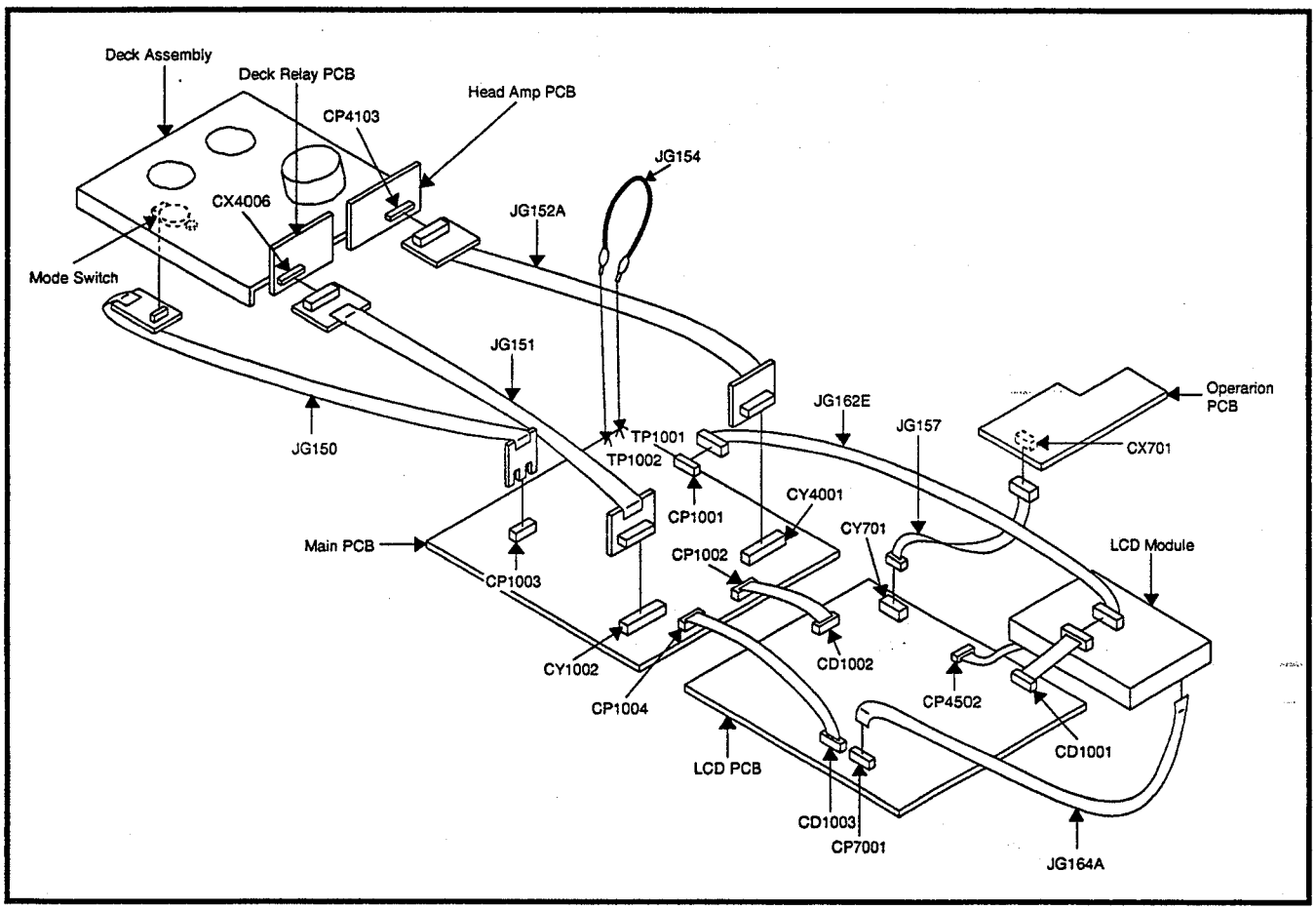
VHS Alignment Tape JG001E (VP1S-LI6[3]) JG001F (VP1S-C01[3]) 	JG002B Adapter JG002F Dial Torque Gauge (60~600gr/cm) JG002G (100~1200gr/cm) 	JG005 Post Adjustment Screwdriver 	JG153 X Value Adjustment Screwdriver 
JG022 Master Plane 	JG024 Reel Disk Height Adjustment Jig 	JG100A Torque Tape (VHT-063) 	JG150 Cable 
JG151 Cable 	JG152A Cable 	JG154 Cable 	JG157 Cable 
JG162E Cable 	JG164A Cable 	Tentelometer 	

Part No.	Remarks
JG001E	Monoscope, 6KHz
JG001F	Color Bar, 1KHz
JG002F	Playback Take Up Torque
JG002G	Fast Forward Torque, Rewind Torque, Brake Torque(Take up Reel/Supply Reel)
JG005	Guide Roller Adjustment
JG153	X-Value Adjustment
JG022/JG024	Reel Disk Height Adjustment
JG100A	Playback Back Tension Torque
JG150	Used to connect the MAIN PCB and MODE SWITCH
JG151	Used to connect the MAIN PCB and DECK RELAY PCB
JG152A	Used to connect the MAIN PCB and HEAD AMP PCB
JG154	Used to connect the TP1001 and TP1002
JG157	Used to connect the LCD PCB and OPERATION PCB
JG162E	Used to connect the MAIN PCB and LCD PCB
JG164A	Used to connect the LCD PCB and LCD MODULE

PREPARATION FOR SERVICING

How to use the Servicing Fixture

1. Remove the Main PCB from the Deck Chassis.
2. Connect the following connector: (CP1002, CP1004 and CP4502).
3. Connect as shown in the below figure using the Service Fixture.
   - ○ Connect the Main PCB to the Mode Switch with the cable JG150.
   - ○ Connect the Main PCB to the Deck Relay PCB with the cable JG151.
   - ○ Connect the Main PCB to the Head Amp PCB with the cable JG152A.
   - ○ Connect the Main PCB to the LCD PCB with the cable JG162E.
   - ○ Connect the LCD PCB to the Operation PCB with the cable JG157.
   - ○ Connect the LCD PCB to the LCD Module with the cable JG164A.
4. Short circuit between **TP1001** and **TP1002** with the cable JG154.
   (Refer to MAJOR COMPONENT LOCATION GUIDE)
5. The EOT, BOT and Reel Sensor do not work at this moment.
   At that time, the STOP/EJECT button is available to insert and eject the Cassette Tape.



TO CHECK INITIAL SETTING

NOTE:

● If there is an error in the data, the unit may indicate malfunction.

INSTRUCTIONS

1. Unplug the AC cord once and the clock will be non-setting.
2. Receive a TV Broadcast and the Blueback Screen is released.
3. Set the VOLUME to minimum.
4. Press the VOL. DOWN button on the set and the Channel button **(6)** on the remote control simultaneously. The **Fig. 1** appears on the display.
5. Press the SET +/- button on the remote control to modify the address and check the data of each addresses are correct. **(Refer to Table 1)**
6. After checking, turn off the Power.

(If the wrong data is input)

7. Press the SET +/- button on the remote control to set to the address of the wrong data, then press the ENTER button. The data will bink. **(Refer to Fig. 1)**
8. Press the SET +/- button on the remote control to set to the correct data, then press the ENTER button. **(Refer to Table 1)**
9. Repeat the above steps 7 and 8 and input the data into the each Address.
10. After the data input, turn off the Power.

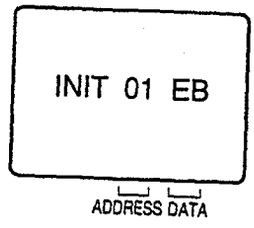


Fig. 1

ADDRESS	INI 01	INI 02	INI 03	INI 04	INI 05	INI 06	INI 07
DATA	02	10	09	10	3C	B1	A8

Table 1

MECHANICAL ADJUSTMENTS

1. CONFIRMATION AND ADJUSTMENT

Read the following NOTED items before starting work.

* Place an object which weighs between 350g and 500g on the Cassette Tape to keep it steady when you want to make the tape run without the Top Loading. (Do not place an object which weighs over 500g.)
* When you activate the deck without the Top Loading, short circuit between **TP1001** and **TP1002**. In this condition the BOT/EOT sensor will not function.

1-1: CONFIRMATION AND ADJUSTMENT OF REEL DISK HEIGHT

1. Turn on the power and set to the STOP mode.
2. Set the master plane **(JG022)** and reel disk height adjustment jig **(JG024)** on mechanism framework, taking care not to scratch the drum, as shown in **Fig. 1-1-A**.
3. Confirm that the reel disk is lower than "A" of the reel disk height adjustment jig **(JG024)** on the master plane and higher than "B" as shown in **Fig. 1-1-B**. If it is not, adjust to less than 7.5mm ± 0.2mm with the height adjustment washer.
4. Perform the same adjustment for other reel.

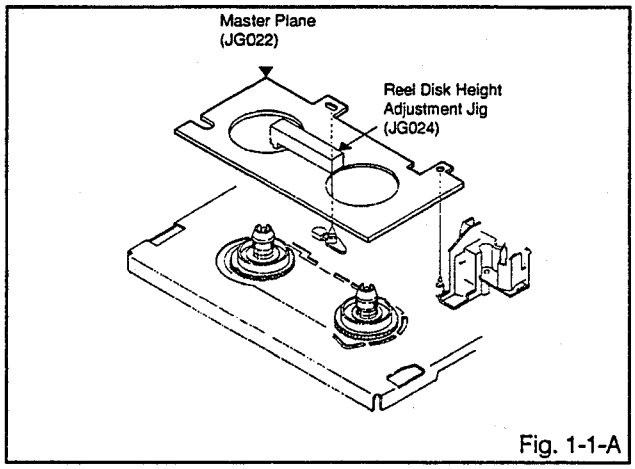


Fig. 1-1-A

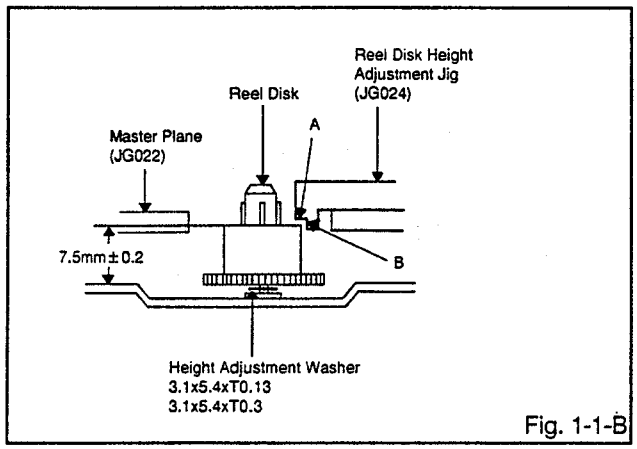


Fig. 1-1-B

1-2: CONFIRMATION AND ADJUSTMENT OF TENSION POST POSITION

1. Turn on the power and set to the PLAY mode adjust the Tension Adjust so that the Tension Post is at the position of 0.3mm~0.5mm from the Rib. **(Refer to Fig. 1-2)**
2. Confirm that the video tape is not curling at the flange of P1 post or is not running on flanges.

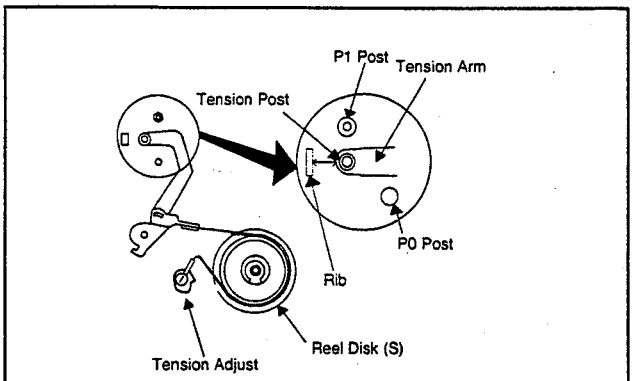


Fig. 1-2

1-3: CONFIRMATION AND ADJUSTMENT OF BACK TENSION ON PLAYBACK

1. Load a video tape recorded in standard speed mode. Set the unit to the PLAY mode.
2. Install the tentelometer as shown in **Fig. 1-3**. Confirm the value is within 20~27gr/cm at this time.

※ IN CASE OF USING A CASSETTE TYPE TORQUE TAPE.

1. After adjustment, confirm and adjust the tension post position **(Refer to item 1-2)** for the tension arm, install the cassette type torque tape **(JG100A)** and set to the PLAY mode.
2. Confirm that the left hand side tension value of the torque tape is 25~38gr/cm for the standard mode tape.

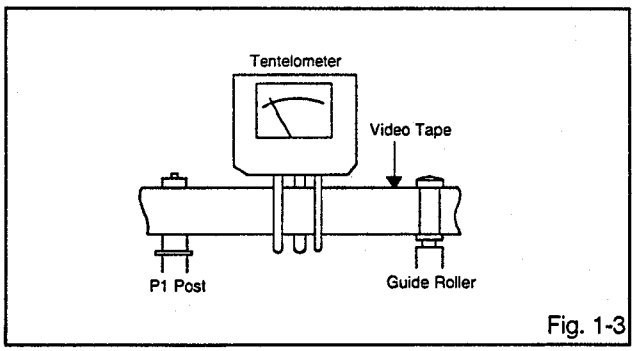


Fig. 1-3

MECHANICAL ADJUSTMENTS

1-4: CONFIRMATION OF FAST FORWARD TORQUE

1. Set torque gauge **(JG002G)** on take-up reel disk, and place unit in FAST FORWARD mode. **(Refer to Fig. 1-4)**
2. Confirm that torque is more than 400gr/cm.

NOTE

After setting the torque gauge on the reel disk, hold the gauge in place.
Push the FAST FORWARD button and the reel disk will begin to turn.

1-5: CONFIRMATION OF REWIND TORQUE

1. Operate within 4 or 5 seconds after the reel disk begins to turn.
2. Set torque gauge **(JG002G)** on supply reel disk, and place the unit in REWIND mode. **(Refer to Fig 1-4).**
3. Confirm that torque is more than 400gr/cm.

NOTE

After setting the torque gauge on the reel disk, hold the gauge in place.
Push the REWIND button and the reel disk will begin to turn.

1-6: CONFIRMATION OF REEL BRAKE TORQUE

(Take-Up Reel Brake) **(Refer to Fig. 1-4)**

1. Set to STOP mode.
2. Set the torque gauge **(JG002G)** to the take-up reel and turn it counterclockwise.
3. Confirm that it is more than 200gr/cm at that time.

(Supply Reel Brake) **(Refer to Fig. 1-4)**

1. Set to STOP mode.
2. Set the torque gauge **(JG002G)** to the supply reel and turn it clockwise.
3. Confirm that it is more than 200gr/cm at that time.

NOTE

Separate the idler from the reel and confirm the brake torque.

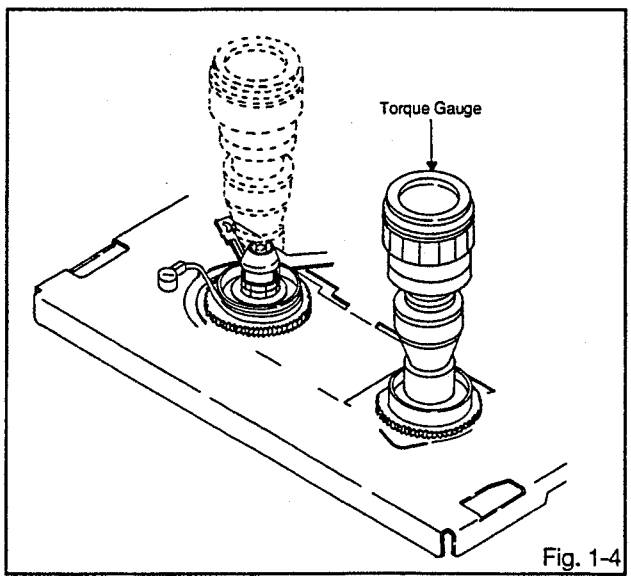


Fig. 1-4

NOTE

If the torque value checked is out of tolerance, replace the appropriate parts as follows.

Check Items	Replace Parts
1-4	Idler Ass'y or Clutch ASS'Y
1-5	Idler Ass'y or Clutch ASS'Y
1-6	Main Brake T Ass'y or Main Brake S Ass'y

2. TAPE RUNNING CONFIRMATION AND ADJUSTMENT

Tape running is adjusted precisely at the factory. Normally, it is not necessary to make adjustments. It is necessary to confirm and make adjustments when the parts of the tape running mechanism are replaced because of extensive usage or failure.

2-1: GUIDE ROLLER

1. Connect CH-1 on the oscilloscope to **TP4002 (PB Envelope)** and CH-2 to **TP4006 (SW Pulse).**
2. Set the tracking to manual center position in the following way. Hold and press the tracking auto button more than 2 seconds to set the tracking to center position.
3. Trigger with SW pulse and observe the envelope. **(Refer to Fig. 2-1-A)**
4. Adjust the guide roller height while observing the envelope, and make the envelope flat. Adjust the envelope so that the flatness will not be affected even when the tracking control button is pressed. (Use the adjustment screwdriver **JG005**).
5. Press and hold the tracking control button and (at the point that the envelope waveform starts to reduce) adjust the envelope so that the A : B ratio is better than 3 : 2. **(Refer to Fig. 2-1-B)**
6. Adjust the PG shifter **(ELECTRICAL ADJUSTMENTS : ITEM 3-1)** in the PLAY mode.

NOTE

After adjustment, confirm and adjust A/C head tilt. **(Refer to item 2-2)**

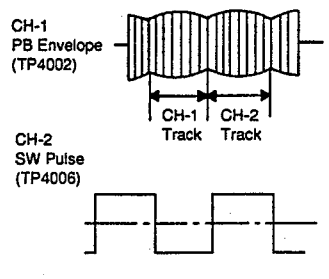


Fig. 2-1-A

MECHANICAL ADJUSTMENTS

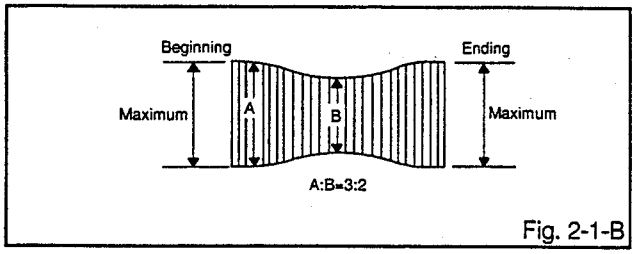


Fig. 2-1-B

2-2: CONFIRMATION AND ADJUSTMENT OF A/C HEAD TILT

When the tape is running abnormally, perform the following adjustments.

1. Insert a new tape and play it back.
2. Confirm that there is no crease on the tape between the P4 post and guide roller (R) and the tape is running smoothly. (It is absolutely impossible to get satisfactory sound if the tape is distorted between the A/C head and P4 post.)
3. If the tape still does not run smoothly, turn the screw ① and adjust the tilt of the A/C head. **(Refer to Fig. 2-2)**

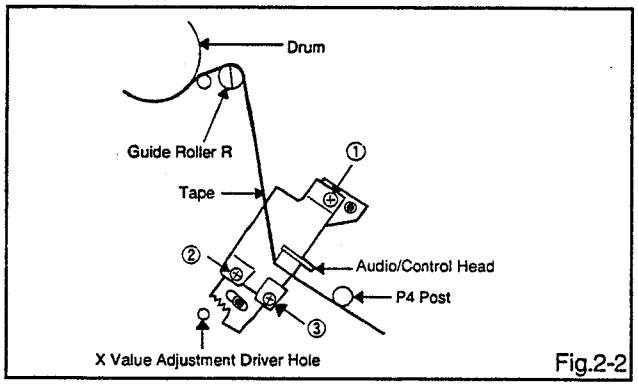


Fig.2-2

2-3: ADJUSTMENT OF A/C HEAD HEIGHT AND AZIMUTH

1. Playback a VHS alignment tape **(JG001E)** and observe the waveform at the audio output terminal.
2. Turn the screw ② slowly to change the azimuth of the A/C head. Adjust the height so that the audio output becomes maximum. **(Refer to Fig. 2-2)**
3. Adjust the screw ③, **(Refer to Fig. 2-2)** until the height of the A/C head reaches the position against the tape as shown in **Fig. 2-3.**
4. When the control head height is not fit. (When you must turn the screw more than 45 degrees), Turn all of the screws ①, ② and ③ to the same degrees. Then confirm the angle of the audio/control head and adjust again.

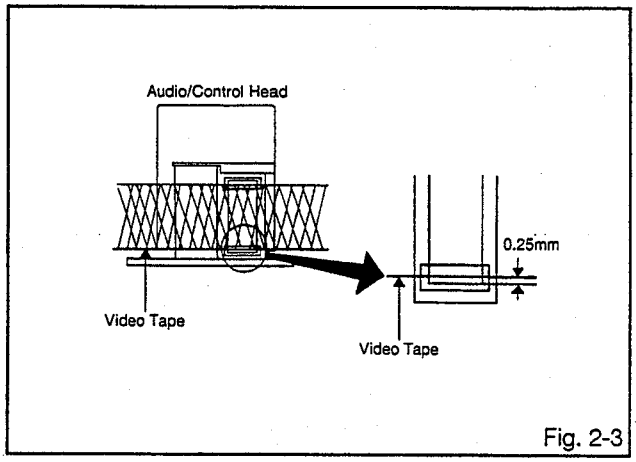


Fig. 2-3

2-4: TAPE RUNNING ADJUSTMENT

1. Adjust the height of reel disk. **(Refer to item 1-1)**
2. Confirm and adjust tension post position. **(Refer to item 1-2)**
3. Adjust the guide roller. **(Refer to item 2-1)**
4. Adjust the A/C head tilt. **(Refer to item 2-2)**
5. Adjust the A/C head height and azimuth. **(Refer to item 2-3)**
6. Connect CH-1 on the oscilloscope to **TP4002** and CH-2 to **TP4006**. Playback the VHS alignment tape **(JG001E)**. Set the tracking to manual center. Adjust X with the screw driver for X **(JG153)** as the **Fig. 2-1-A** and **Fig. 2-1-B**. **(Refer to No. 2 of the item 2-1).**

ELECTRICAL ADJUSTMENTS

1. BEFORE MAKING ELECTRICAL ADJUSTMENTS

Read and perform these adjustments when repairing the circuits or replacing electrical parts or PCB assemblies.

CAUTION

Inferior silicon grease can damage IC's and transistors. When replacing IC's and transistors, use only specified silicon grease (YG6260M).
Remove all old silicon before applying new silicon.

1-1: Prepare the following measurement and servicing tools for electrical adjustments.

1. Oscilloscope
2. Digital Voltmeter
3. Sweepmarker Generator
4. Color Bar Generator
5. Photo Sensor Amp
6. Oscillator
7. Frequency Counter
8. Alignment Tape (**JG001E**) or Similar

2. BASIC ADJUSTMENTS

On-Screen Display Adjustment

1. Unplug the AC cord once and the clock will be non-setting.
2. Set the VOLUME to minimum.
3. Press the VOL. DOWN button on the set and the channel button **(9)** on the remote control simultaneously to display the adjustment mode on the screen as shown in **Fig. 2-1** (TV mode) and **Fig. 2-2** (AUX mode).

NOTE

※ Use the channel button (1 - 7) on the remote control to select the options shown in **Fig. 2-1** and **Fig. 2-2.**
※ Press the channel button (8) on the remote control to end the adjustments.

ADJUSTMENT MODE (TV)
1. AGC/BRI/COL AUTO
2. SUB BRIGHT AUTO
3. AGC MANUAL
4. COLOR MANUAL
5.
6. BRIGHT MANUAL
7. V. SIZE MANUAL
8. END

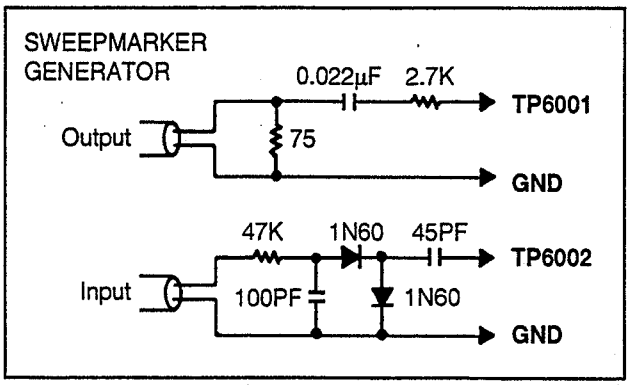
Fig. 2-1

ADJUSTMENT MODE (AU)
1. /BRI/COL AUTO
2. SUB BRIGHT AUTO
3.
4. COLOR MANUAL
5.
6. BRIGHT MANUAL
7.
8. END

Fig. 2-2

2-1: TRAP

1. Connect input and output terminals of the sweepmarker generator to the circuit as shown below.



2. Adjust the **L6003** until the waveform marker (31.9MHz) becomes peak. **(Refer to Fig. 2-3)**

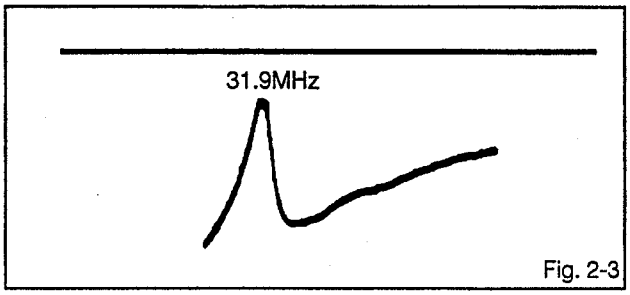


Fig. 2-3

2-2: VCO

1. Connect the oscillator (38.9 MHz) to **TP6001.**
2. Connect the digital voltmeter to **TP6004.**
3. Adjust the **L6006** until the voltage is equal to 2.5 ± 0.1V.

2-3: RF AGC

1. Receive the E-11CH (80dB).
2. Connect the digital voltmeter to **TP6003.**
3. Activate the adjustment mode display of **Fig. 2-1** and press the channel button **(3)** on the remote control.
4. Press the VOL. UP/DOWN button on the remote control until the voltage is equal to 3.5 ± 0.1V.

2-4: HUE DL.

1. Receive the color bar pattern.
2. Connect the oscilloscope to **TP7003** through the prove 10:1.
3. Adjust the **VR7003** until the width of waveform point (B) is 0. **(Refer to Fig. 2-4)**
4. Adjust the **L7004** and **L7005** until the width of waveform point (A) is 0.
5. Adjust the **VR7003** until the width of waveform point (B) is 0 again.

ELECTRICAL ADJUSTMENTS

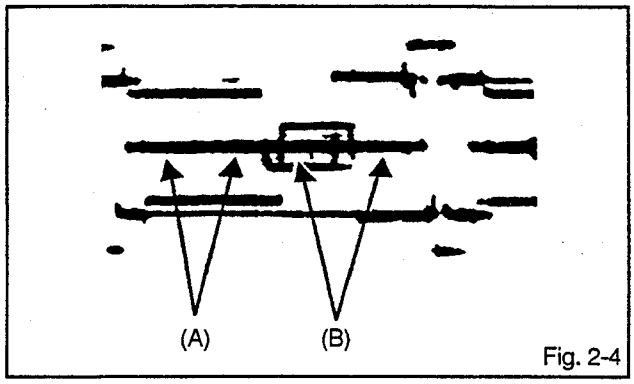


Fig. 2-4

2-5-A: SUB BRIGHT (TV)

1. Connect the oscilloscope to **TP7002** through the prove 10:1.
2. Receive the color bar pattern (Chroma Off, Burst Off, RF Input).
3. Activate the adjustment mode display of **Fig. 2-1** and press the channel button **(6)** on the remote control.
4. Press the VOL. UP/DOWN button on the remote control until the waveform point (A) becomes 5.0 ± 0.1Vp-p. **(Refer to Fig. 2-5)**

2-5-B: SUB BRIGHT (AUX)

1. Connect the oscilloscope to **TP7002** through the prove 10:1.
2. Receive the color bar pattern (Chroma Off, Burst Off, Audio Video Input).
3. Activate the adjustment mode display of **Fig. 2-2** and press the channel button **(6)** on the remote control.
4. Press the VOL. UP/DOWN button on the remote control until the waveform point (A) becomes 5.0 ± 0.1Vp-p. **(Refer to Fig. 2-5)**

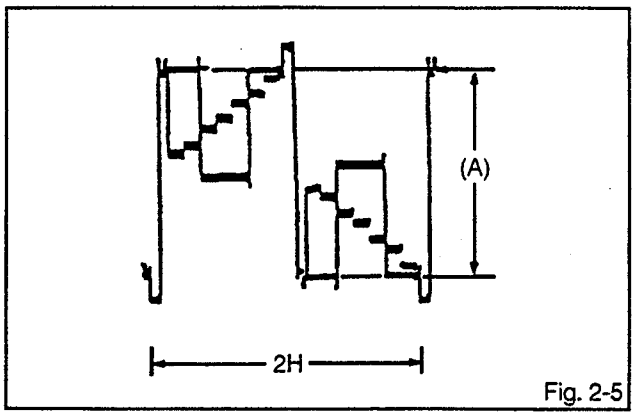


Fig. 2-5

2-6: SUB CONTRAST

1. Connect the oscilloscope to **TP7002** through the prove 10:1.
2. Receive the color bar pattern (Chroma Off, Burst Off).
3. Adjust the **VR7007** until the waveform point (A) becomes 3.5 ± 0.1Vp-p. **(Refer to Fig. 2-6)**

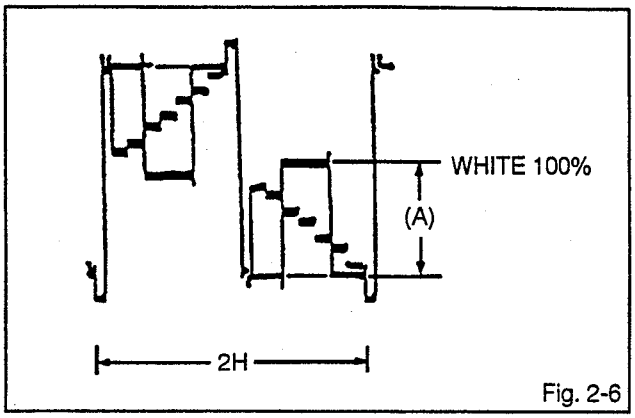


Fig. 2-6

2-7-A: SUB COLOR (TV)

1. Connect the oscilloscope to **TP7001** through the prove 10:1.
2. Receive the color bar pattern (RF Input).
3. Activate the adjustment mode display of **Fig. 2-1** and press the channel button **(4)** on the remote control.
4. Press the VOL. UP/DOWN button on the remote control until the waveform point (A) becomes 0.0 ± 0.1Vp-p. **(Refer to Fig. 2-7)**

2-7-B: SUB COLOR (AUX)

1. Connect the oscilloscope to **TP7001** through the prove 10:1.
2. Receive the color bar pattern (Audio Video Input).
3. Activate the adjustment mode display of **Fig. 2-2** and press the channel button **(4)** on the remote control.
4. Press the VOL. UP/DOWN button on the remote control until the waveform point (A) becomes 0.0 ± 0.1Vp-p. **(Refer to Fig. 2-7)**

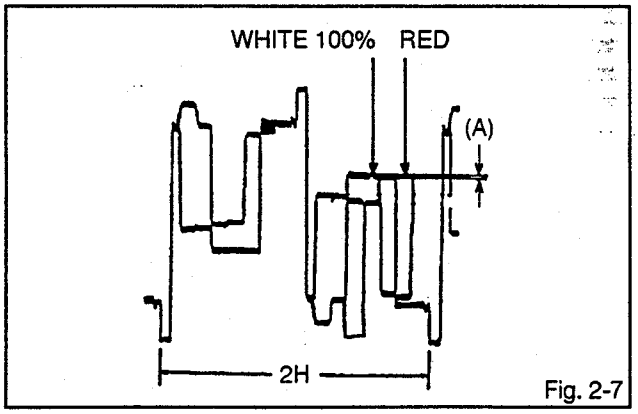


Fig. 2-7

ELECTRICAL ADJUSTMENTS

2-8: V. COM

1. Receive the color bar pattern (Chroma Off, Burst Off, Video level 0.35Vp-p, Sync level 0.3Vp-p, Audio Video Input).
2. Keep the unit as it is more than 10 minutes
3. Connect the output of the photo sensor amp to the oscilloscope.
4. Adjust the **VR7008** until the waveform point (A) becomes minimum. **(Refer to Fig. 2-8)**

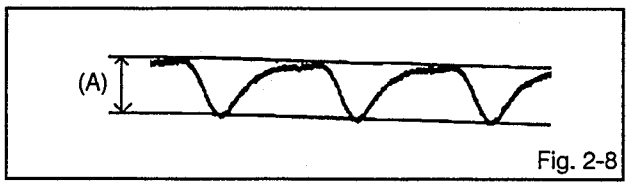


Fig. 2-8

2-9: PG SHIFTER (HEAD SWITCHING)

1. Unplug the AC cord once and the clock will be non-setting.
2. Set the VOLUME to minimum.
3. Playback the alignment tape **(JG001E)** or similar.
4. Press the VOL. DOWN button on the set and the channel button **(3)** on the remote control simultaneously until the indicator REC/OTR disappears. If the indicator REC/OTR disappears, adjustment is completed.

(If the above adjustments doesn't work well:)

1. Connect CH-1 on the oscilloscope to **TP4006** and CH-2 to **TP7005**.
2. Playback the alignment tape **(JG001E)** or similar.
3. Press the VOL. DOWN button on the set and the channel button **(3)** on the remote control simultaneously until the indicator REC/OTR blinks.
4. The REC/OTR indicator is illuminated. Press the VOL. DOWN button on the set and the channel button **(4)** on the remote control simultaneously.
5. Press the Tracking +/- button on the remote control until the waveform of the oscilloscope measures 6.5 ± 0.5 (H) at both leading and trailing edges. **(Refer to Fig. 2-9-A, B)**
6. Press the VOL. DOWN button on the set and the channel button **(3)** on the remote control simultaneously until the indicator REC/OTR blinks. If the indicator REC/OTR disappears, adjustment is completed.

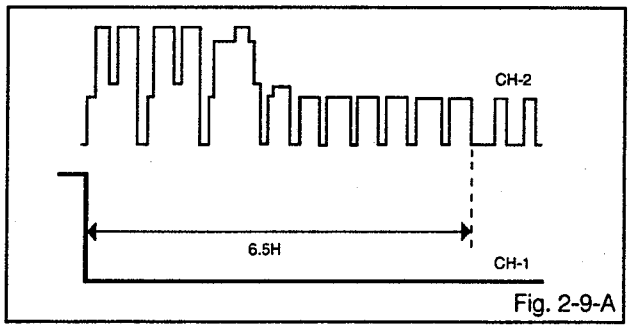


Fig. 2-9-A

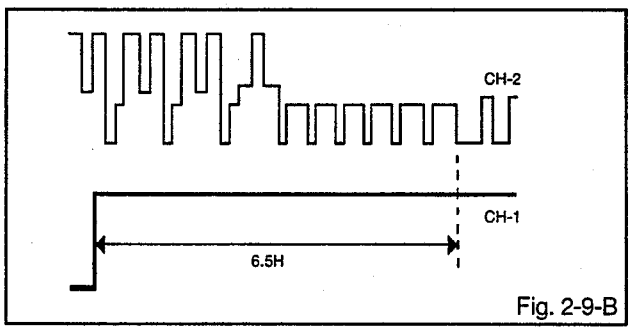
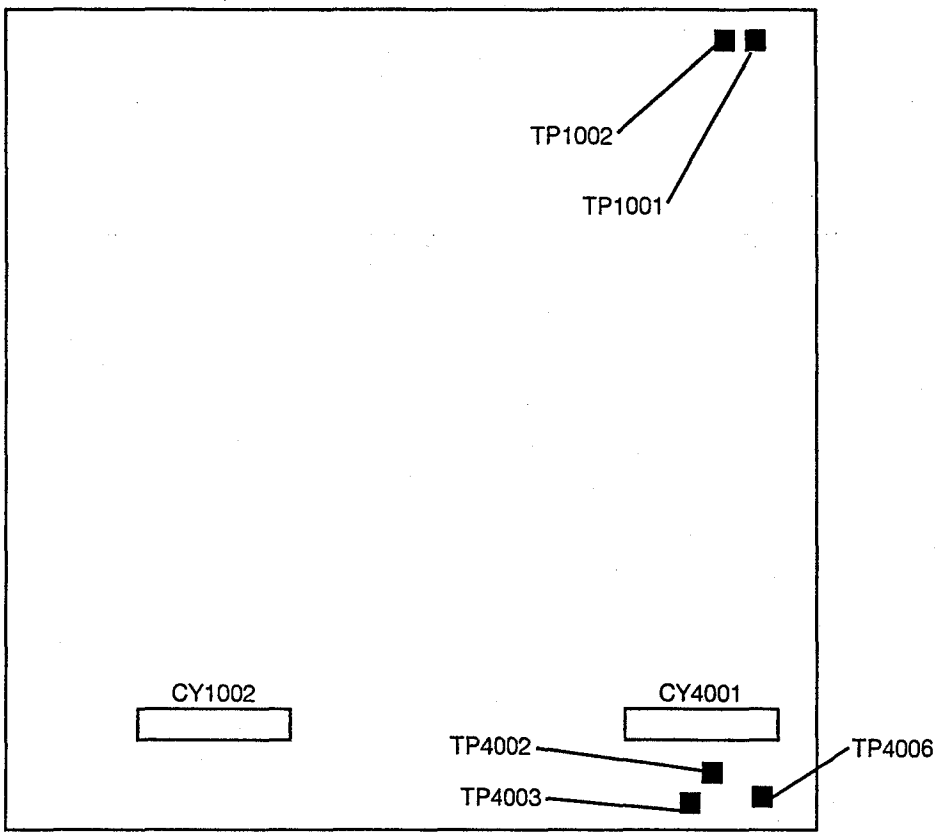


Fig. 2-9-B

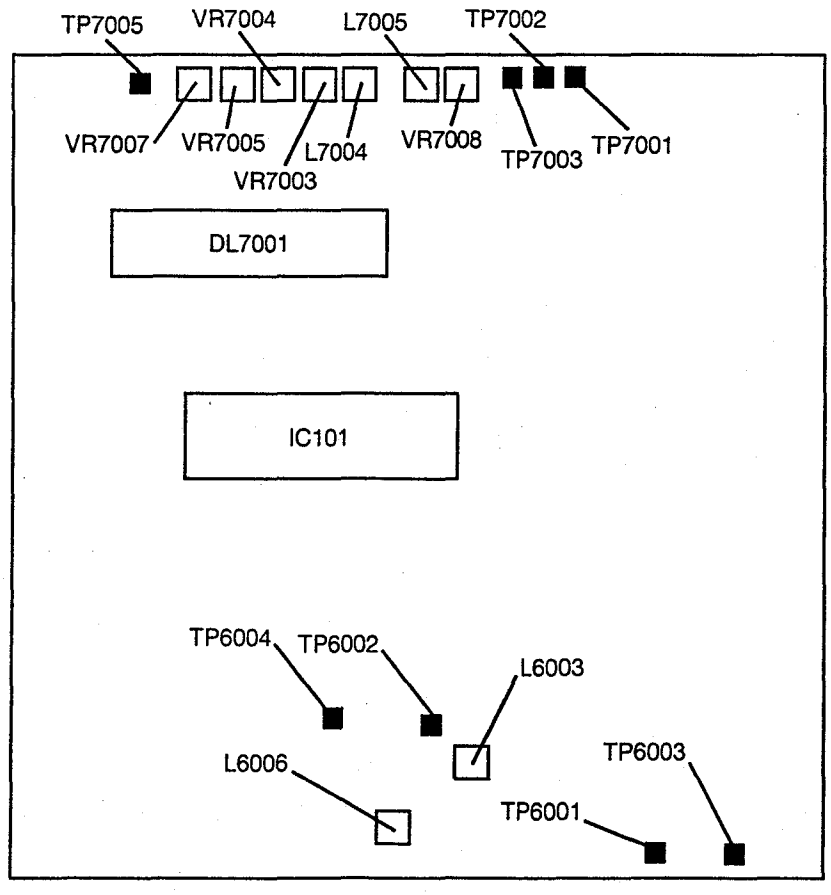
2-10: WHITE BALANCE

1. Receive the color bar pattern.
2. Adjust **VR7004** and **VR7005** until the white color is looked like a white.

MAJOR COMPONENT LOCATION GUIDE

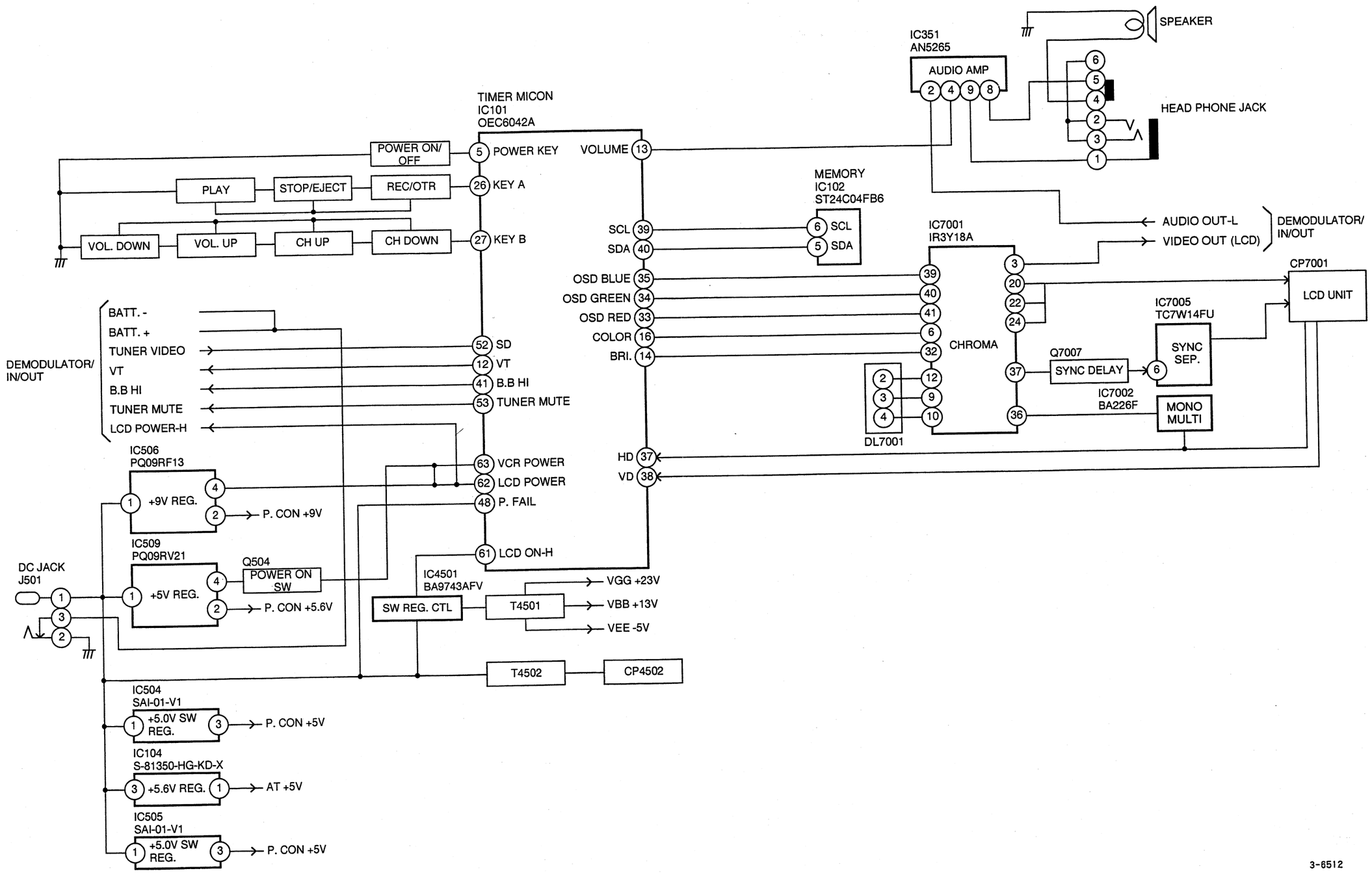


MAIN



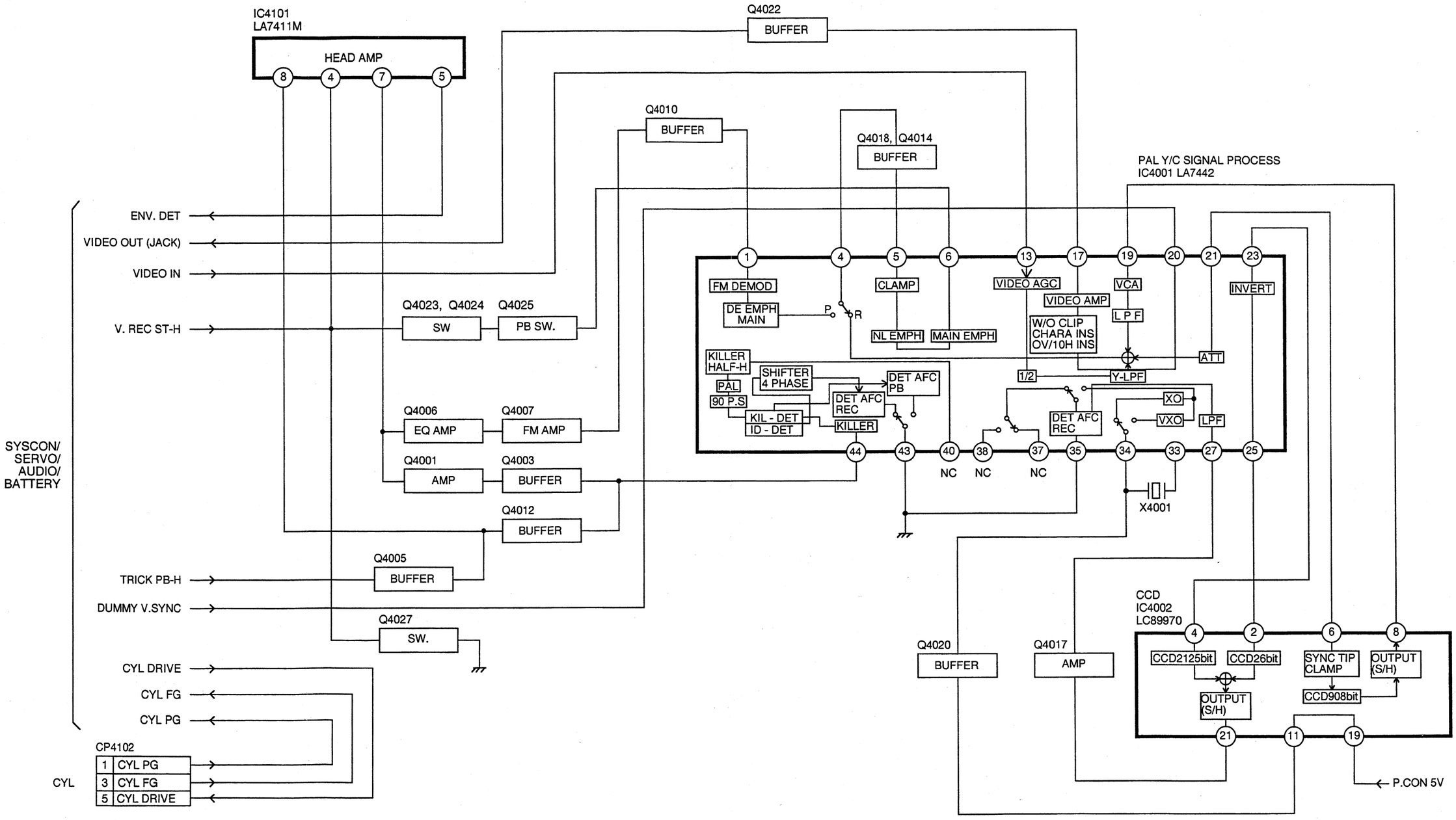
LCD (TOP)

TV BLOCK DIAGRAM



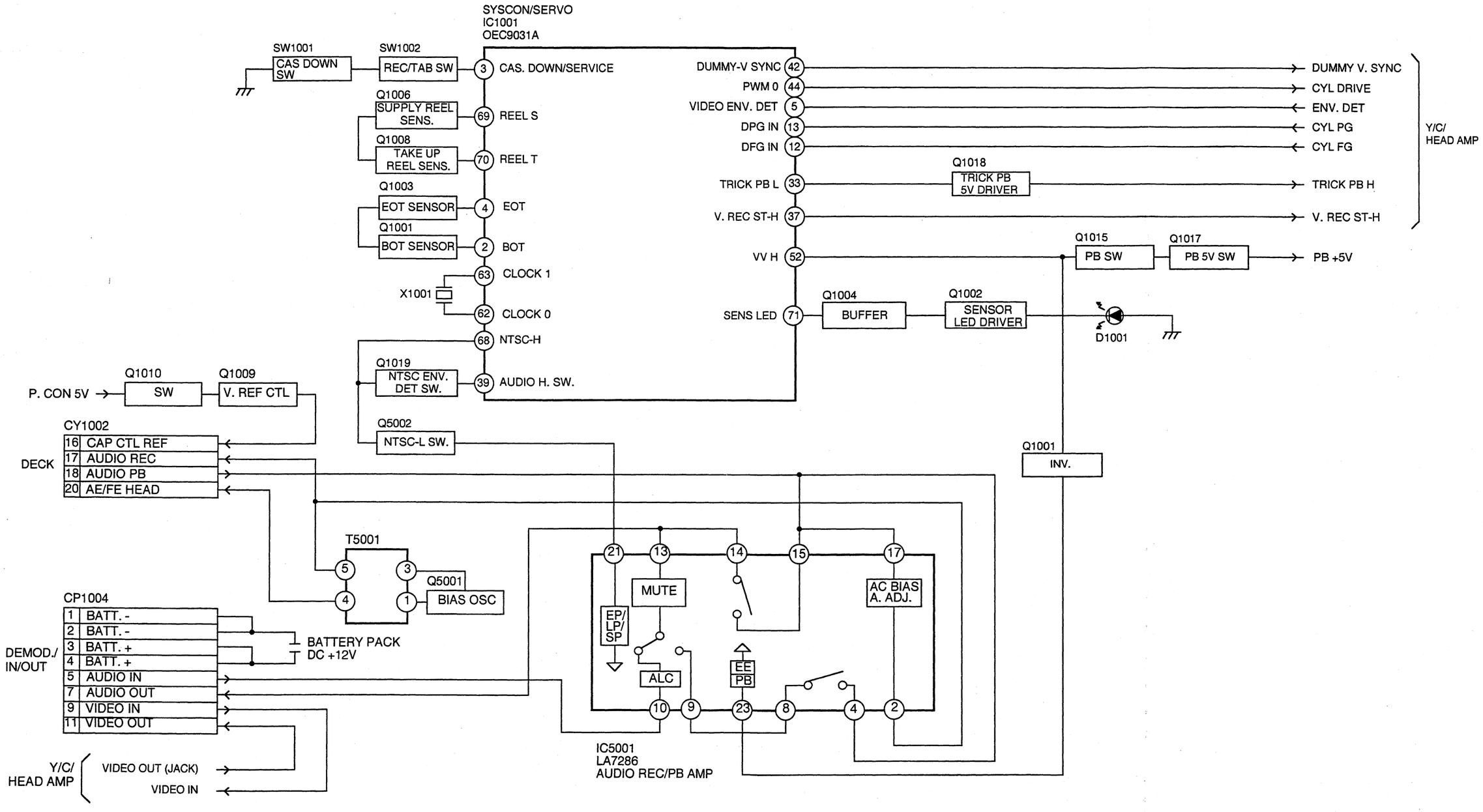
3-6512

Y/C／HEAD AMP BLOCK DIAGRAM



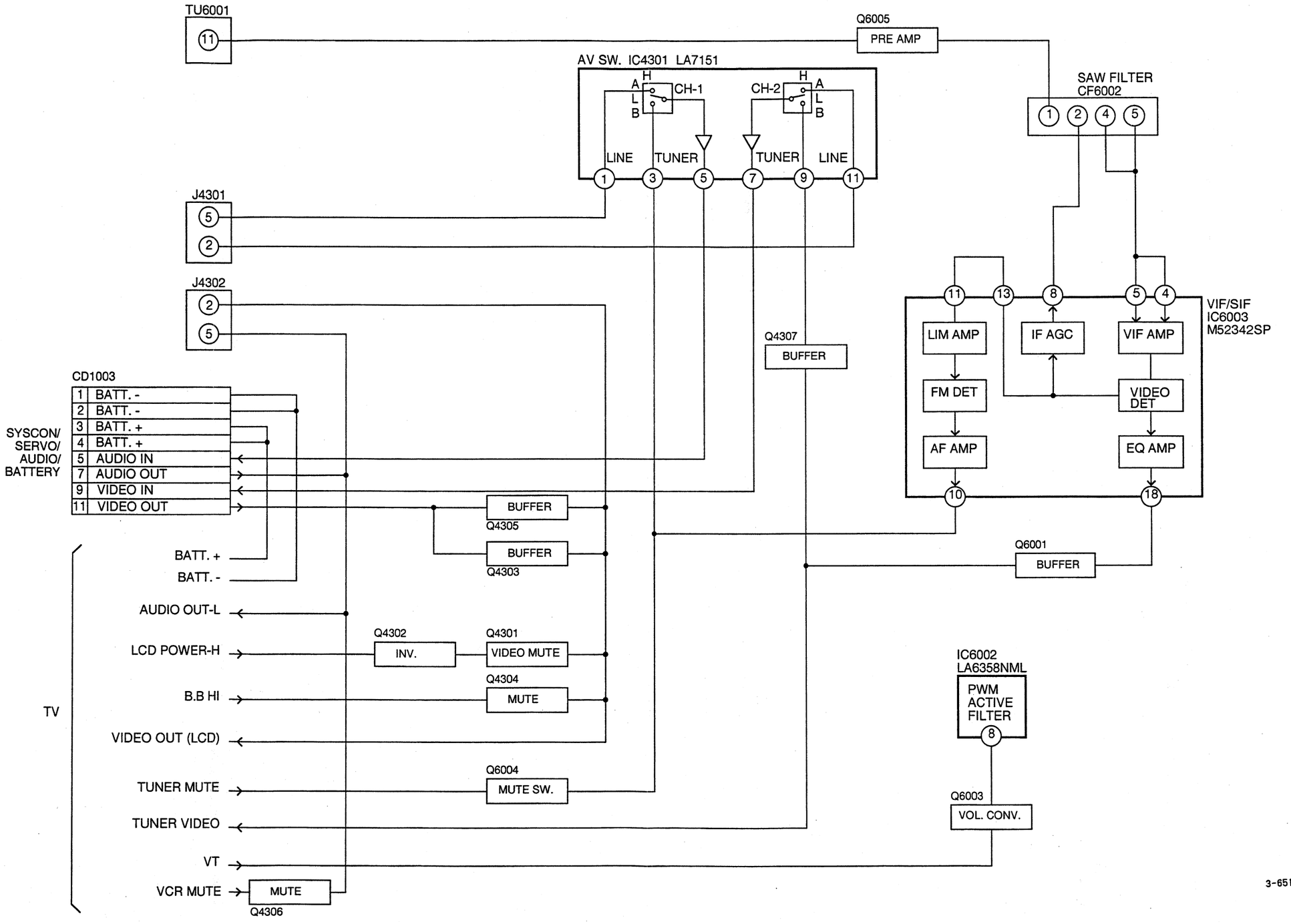
3-6513

SYSTEM CONTROL／SERVO／AUDIO／BATTERY BLOCK DIAGRAM



3-6514

DEMODULATOR／IN/OUT JACK BLOCK DIAGRAM

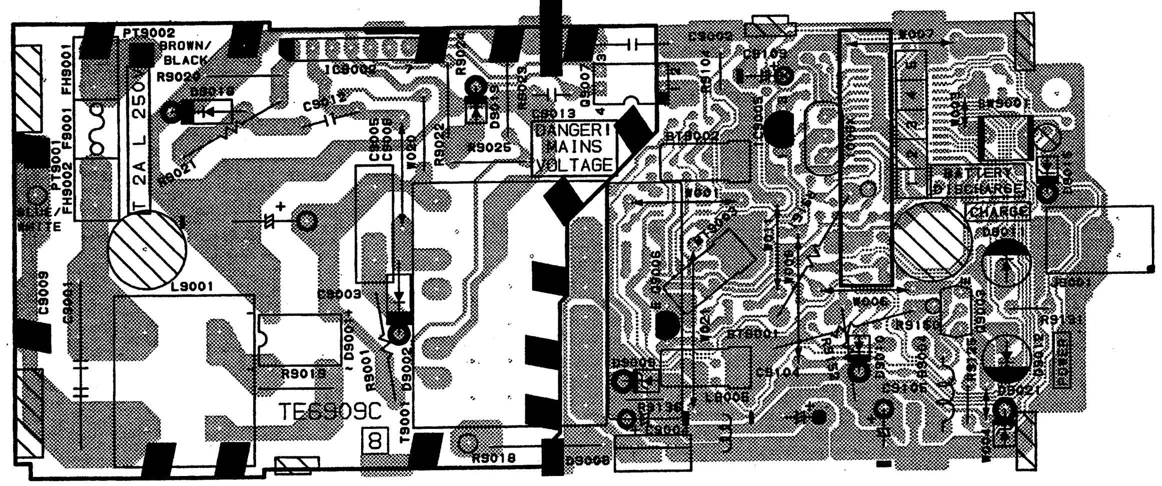


3-6515

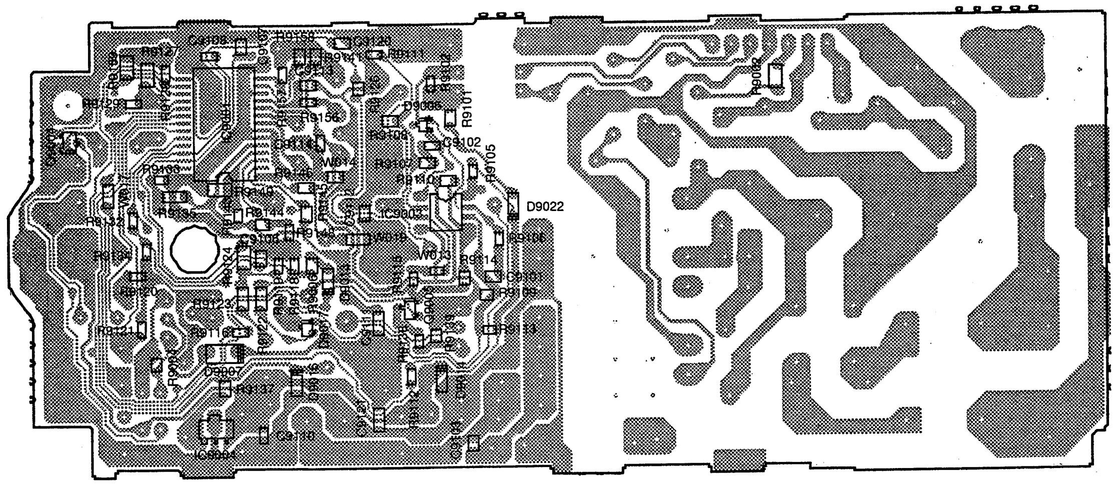
PRINTED CIRCUIT BOARDS

AC ADAPTOR

COMPONENT SIDE

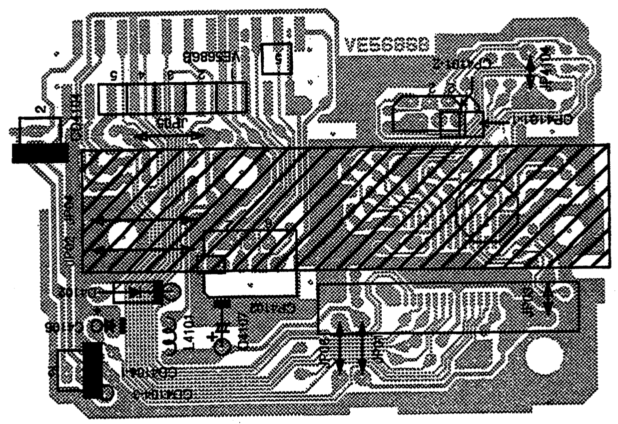


SOLDER SIDE

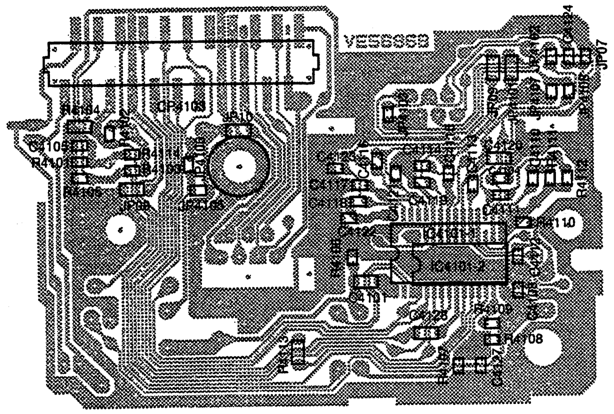


HEAD AMP

COMPONENT SIDE

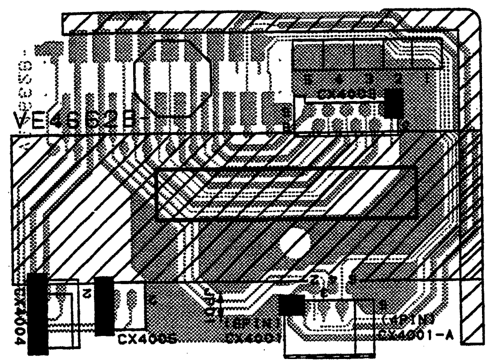


SOLDER SIDE

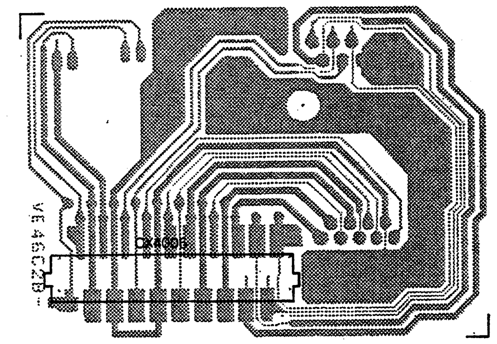


DECK RELAY

COMPONENT SIDE

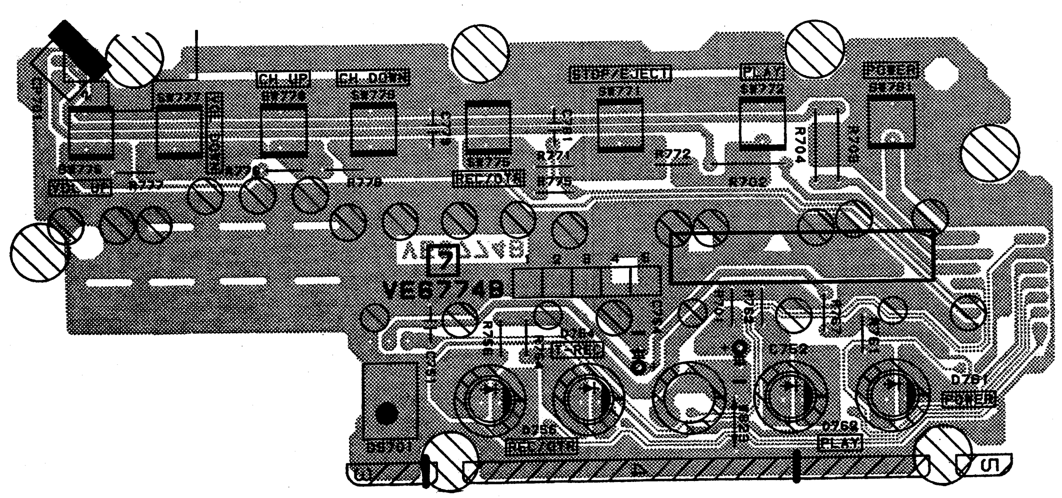


SOLDER SIDE

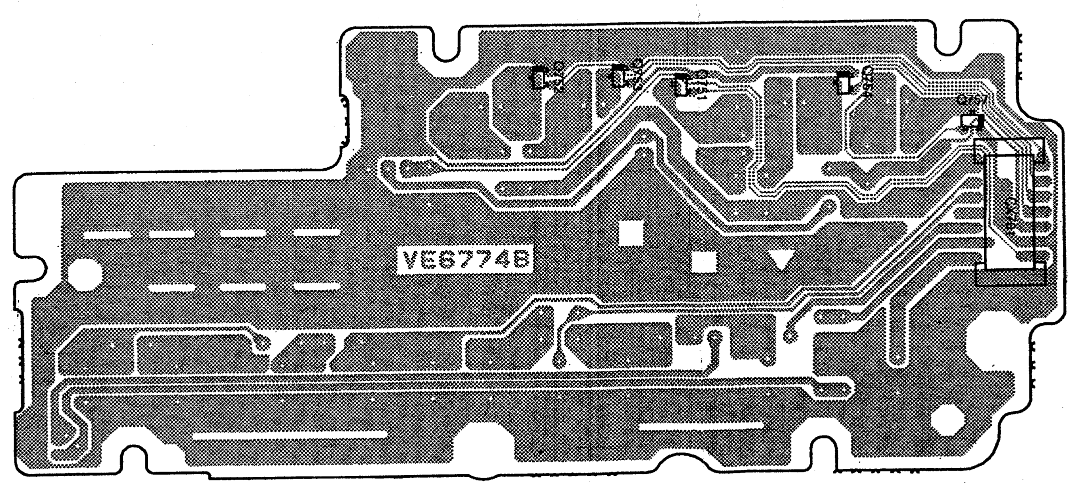


OPERATION

COMPONENT SIDEB



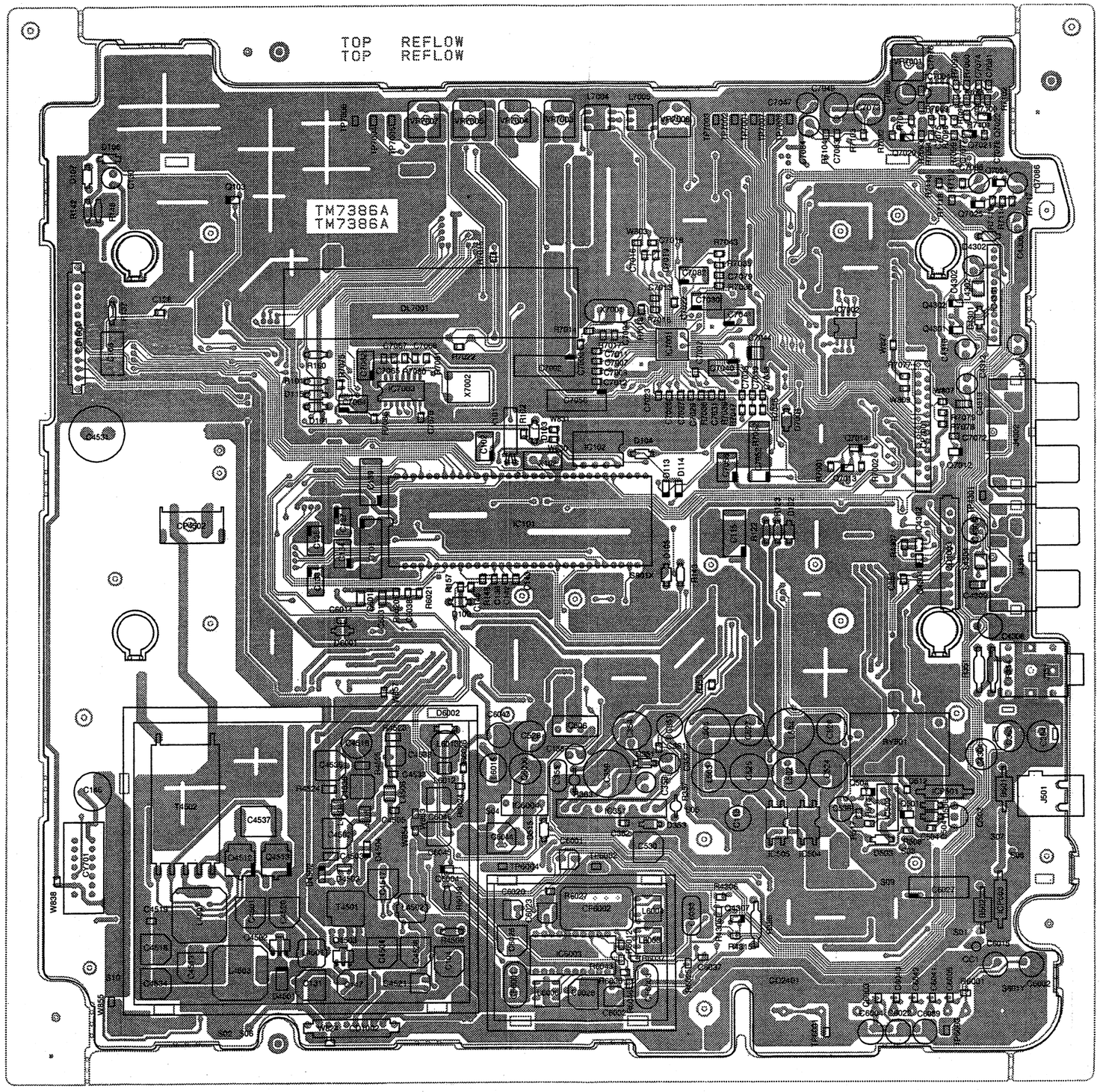
SOLDER SIDE



TV PRINTED CIRCUIT BOARDS

LCD

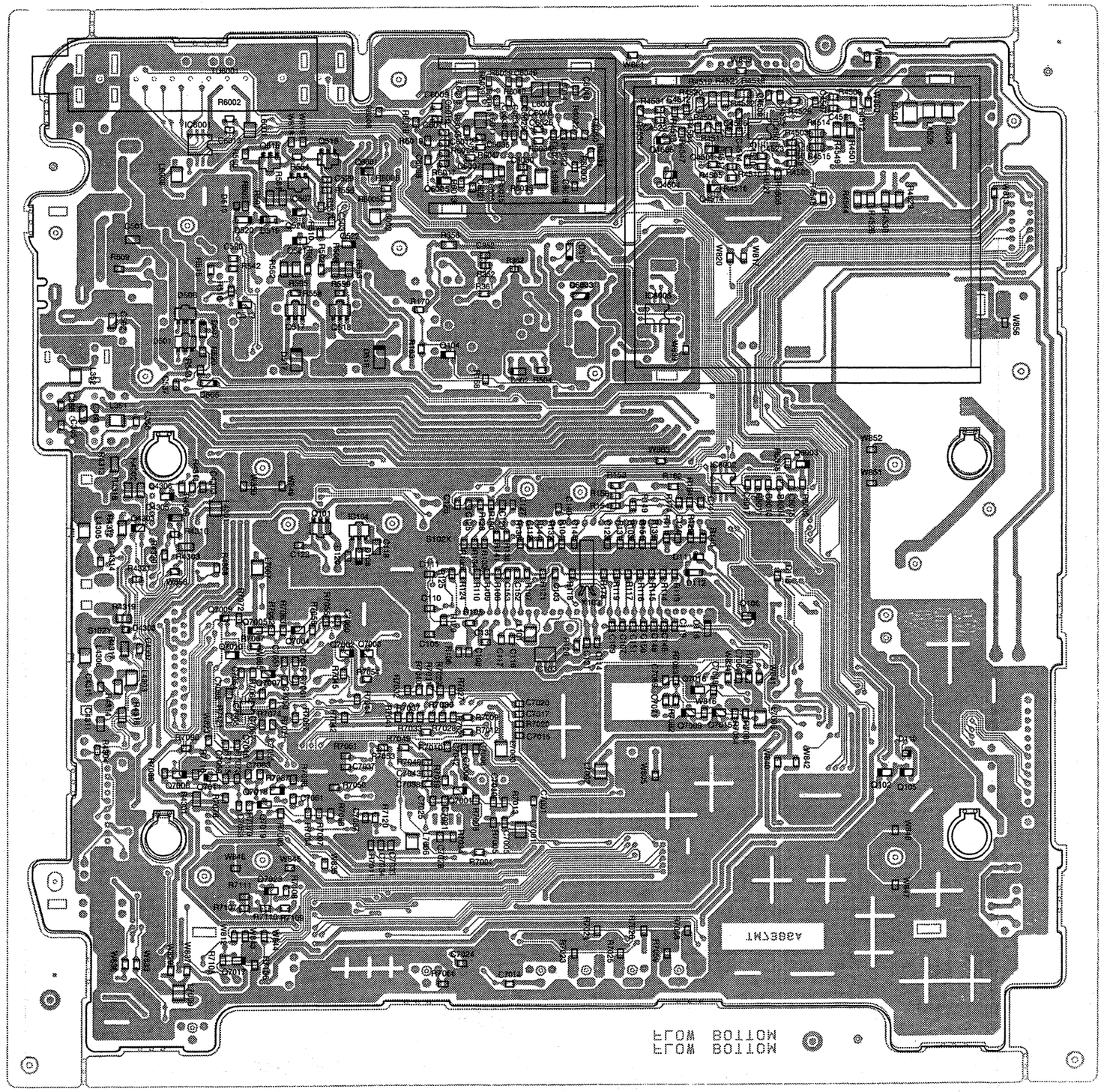
TOP



TV PRINTED CIRCUIT BOARDS

LCD

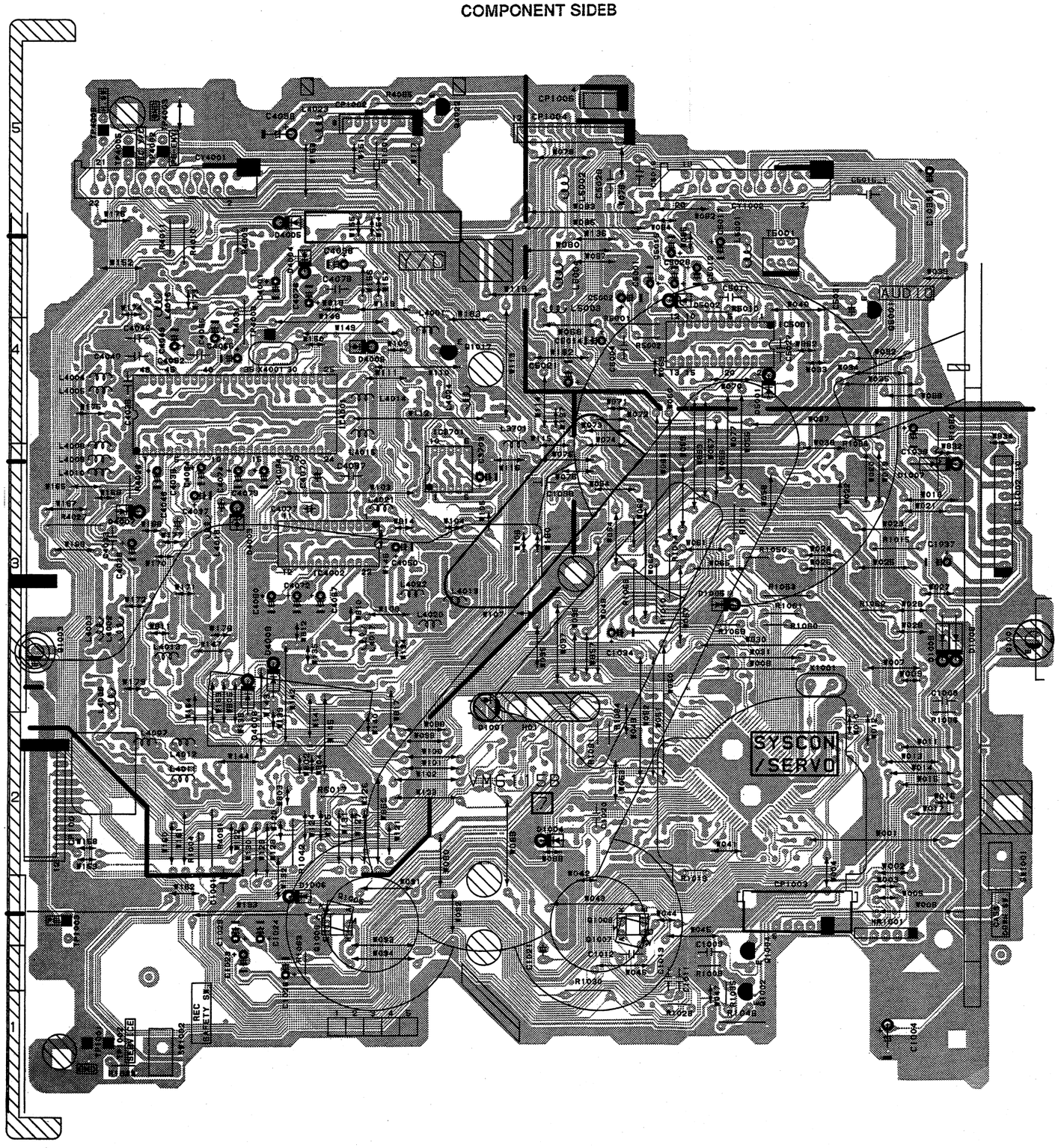
BOTTOM



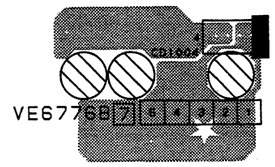
VCR PRINTED CIRCUIT BOARDS

MAIN

COMPONENT SIDEB



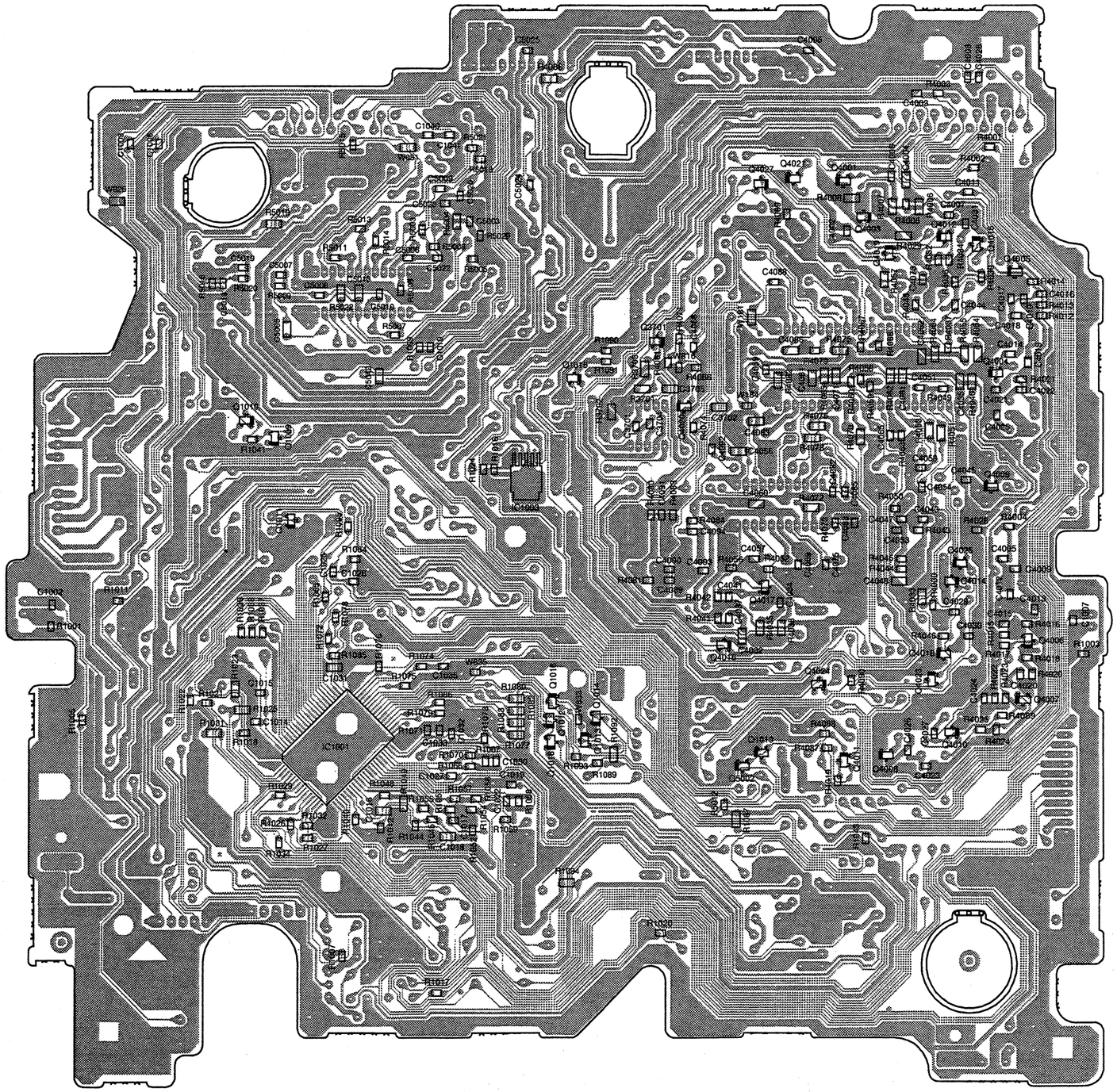
BATTERY



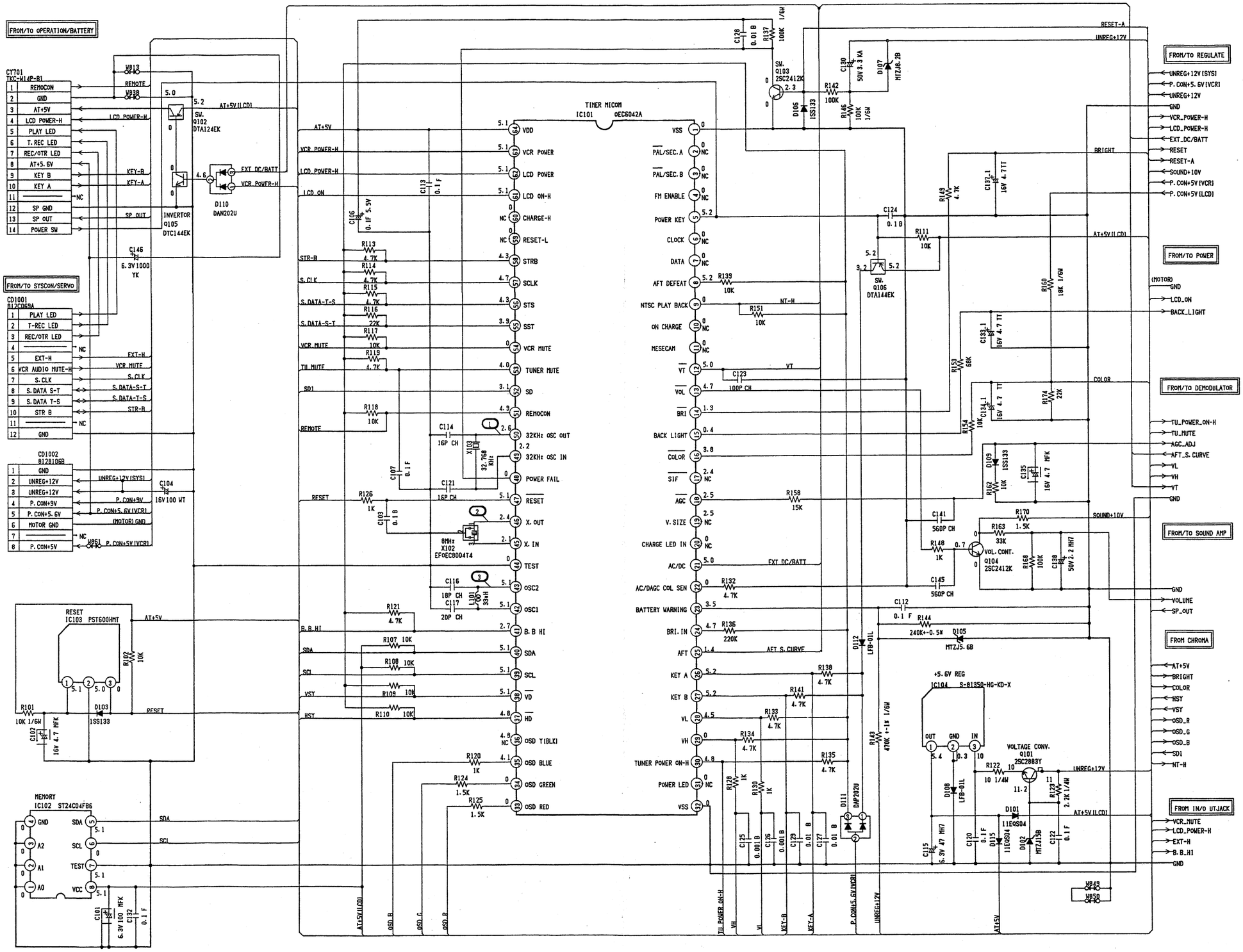
VCR PRINTED CIRCUIT BOARDS

MAIN

SOLDER SIDE



MICON SCHEMATIC DIAGRAM

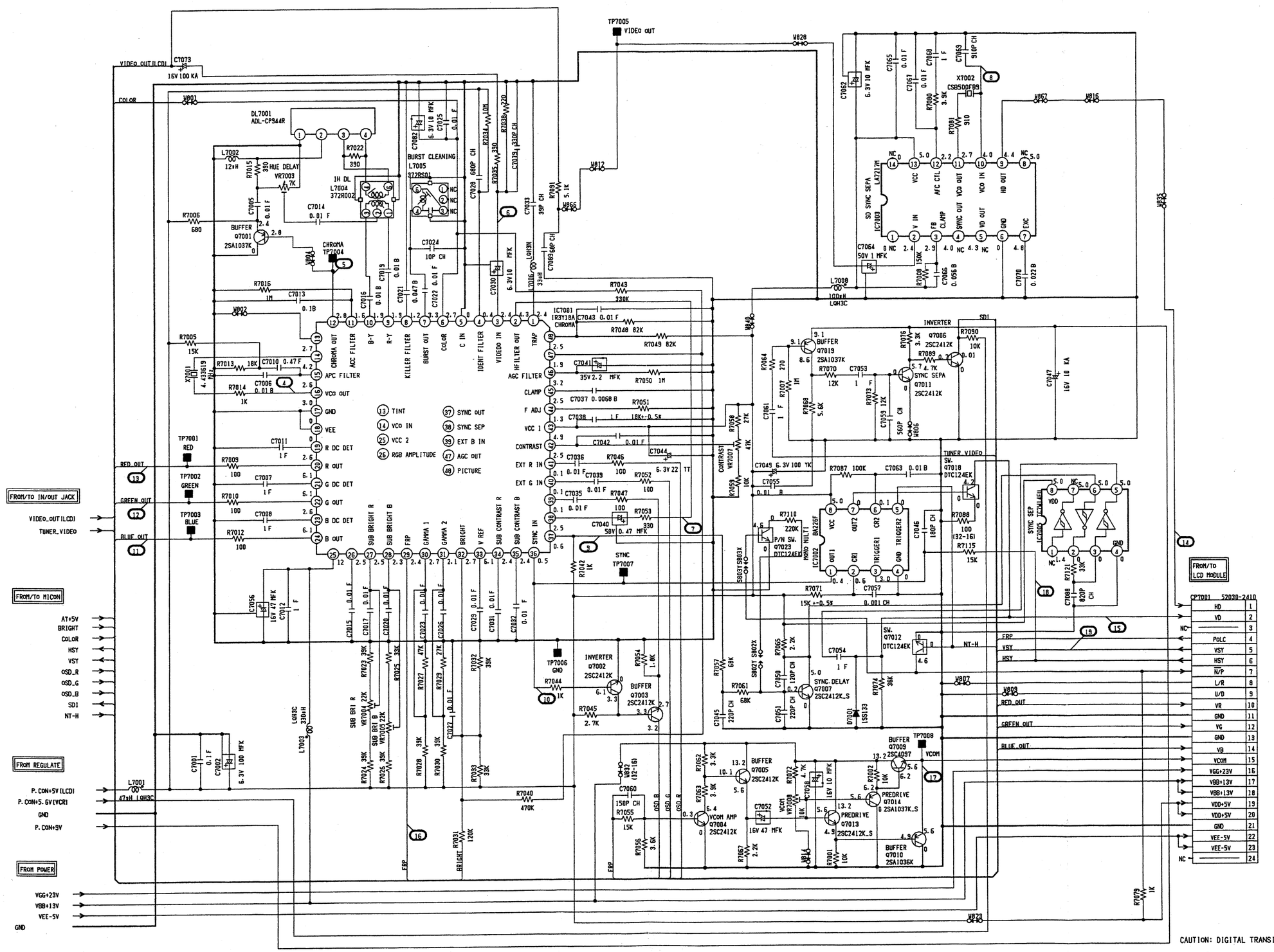


NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

PCB240 TM7386

CHROMA SCHEMATIC DIAGRAM



NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

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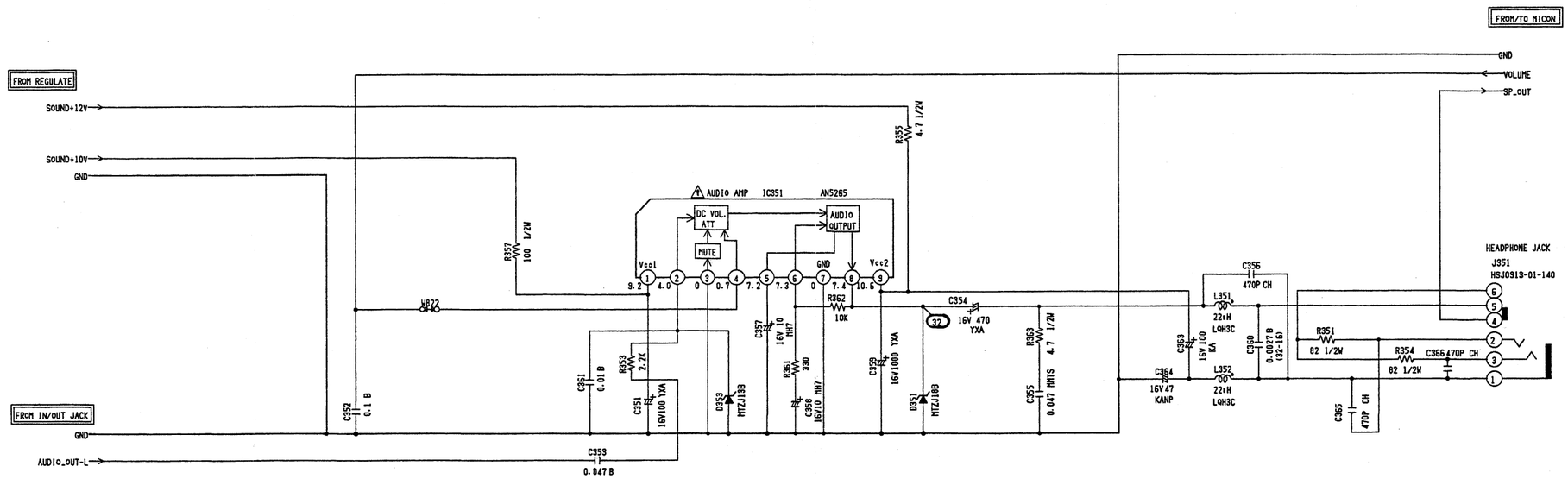
3-6505

SOUND AMP SCHEMATIC DIAGRAM



CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.

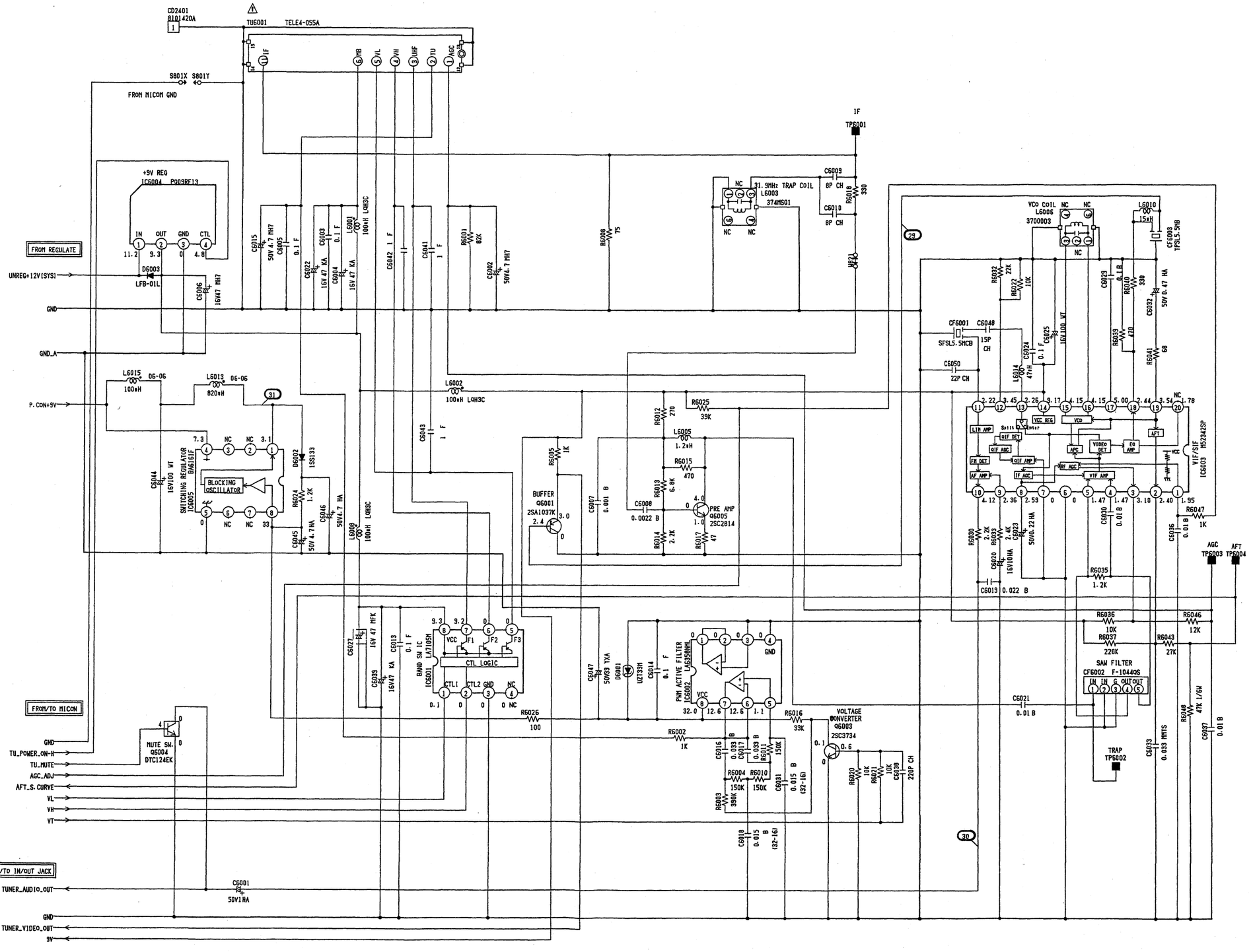
ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

PCB240
TM7386

DEMODULATOR SCHEMATIC DIAGRAM



NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

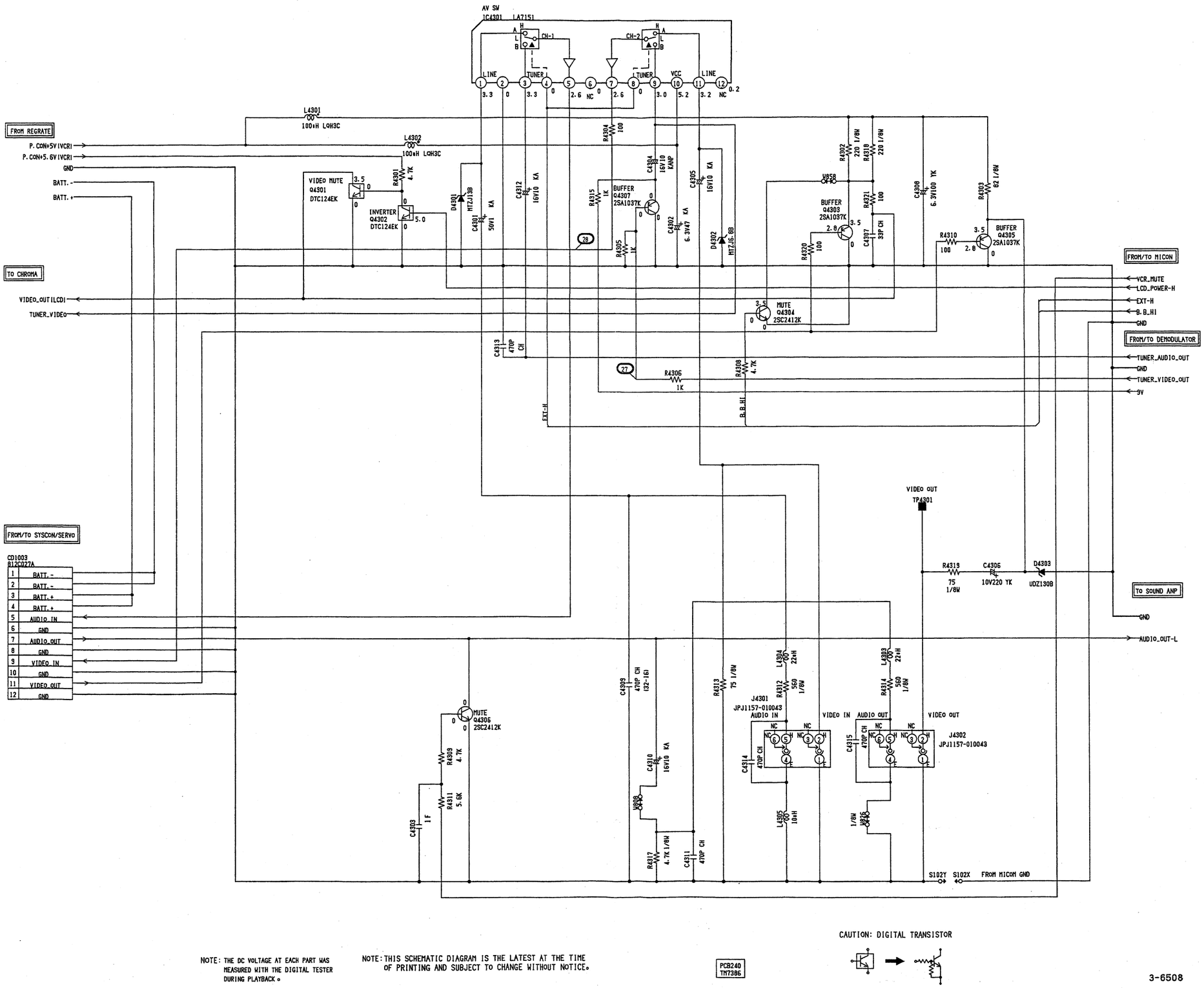
ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES.

CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY. USE ONES DESCRIBED IN PARTS LIST ONLY.

PCB240
TM7386

3-6507

IN/OUT JACK SCHEMATIC DIAGRAM



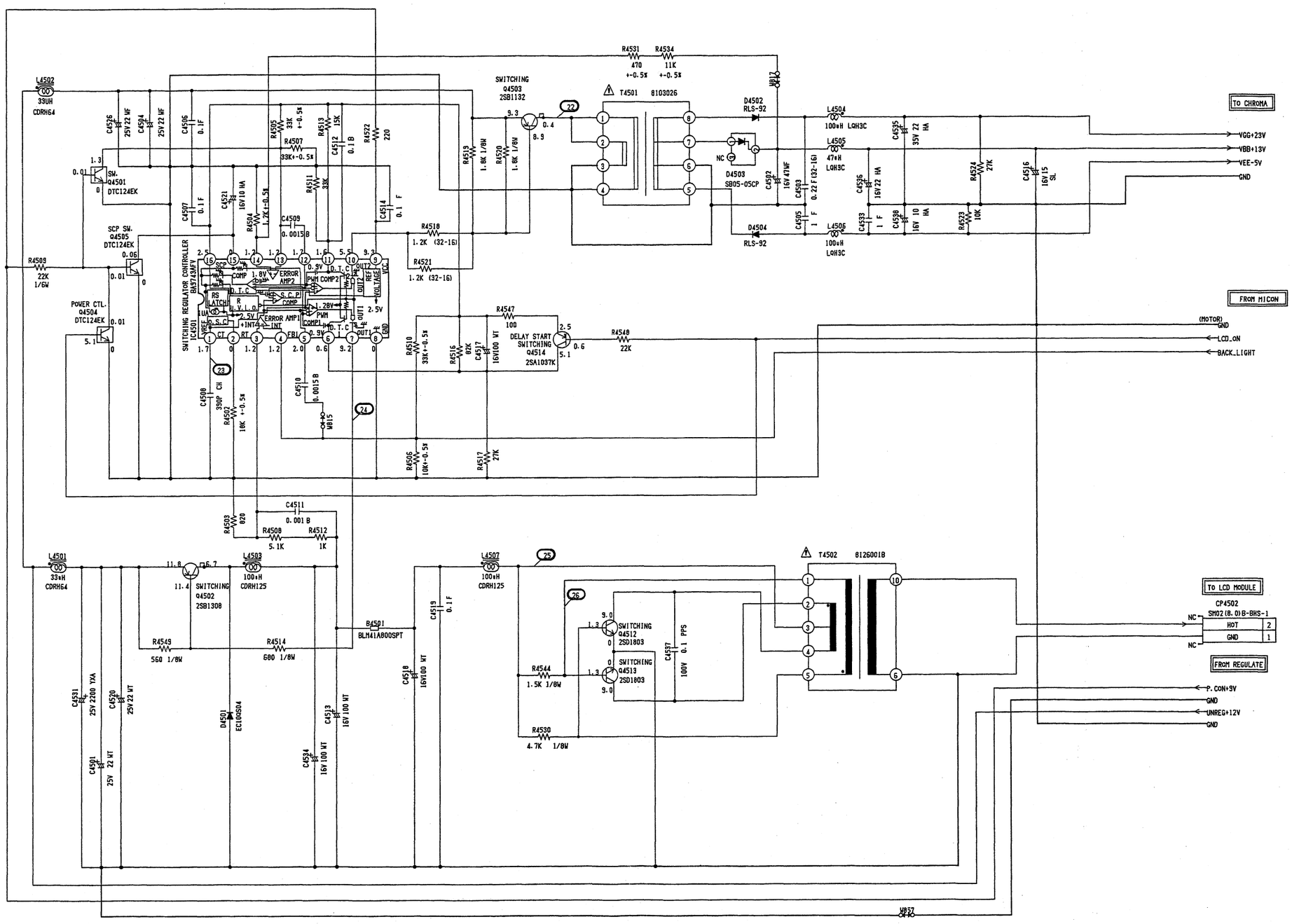
NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

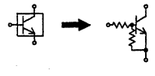
PCB240
TM7386

CAUTION: DIGITAL TRANSISTOR

POWER SCHEMATIC DIAGRAM



CAUTION: DIGITAL TRANSISTOR



NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER .

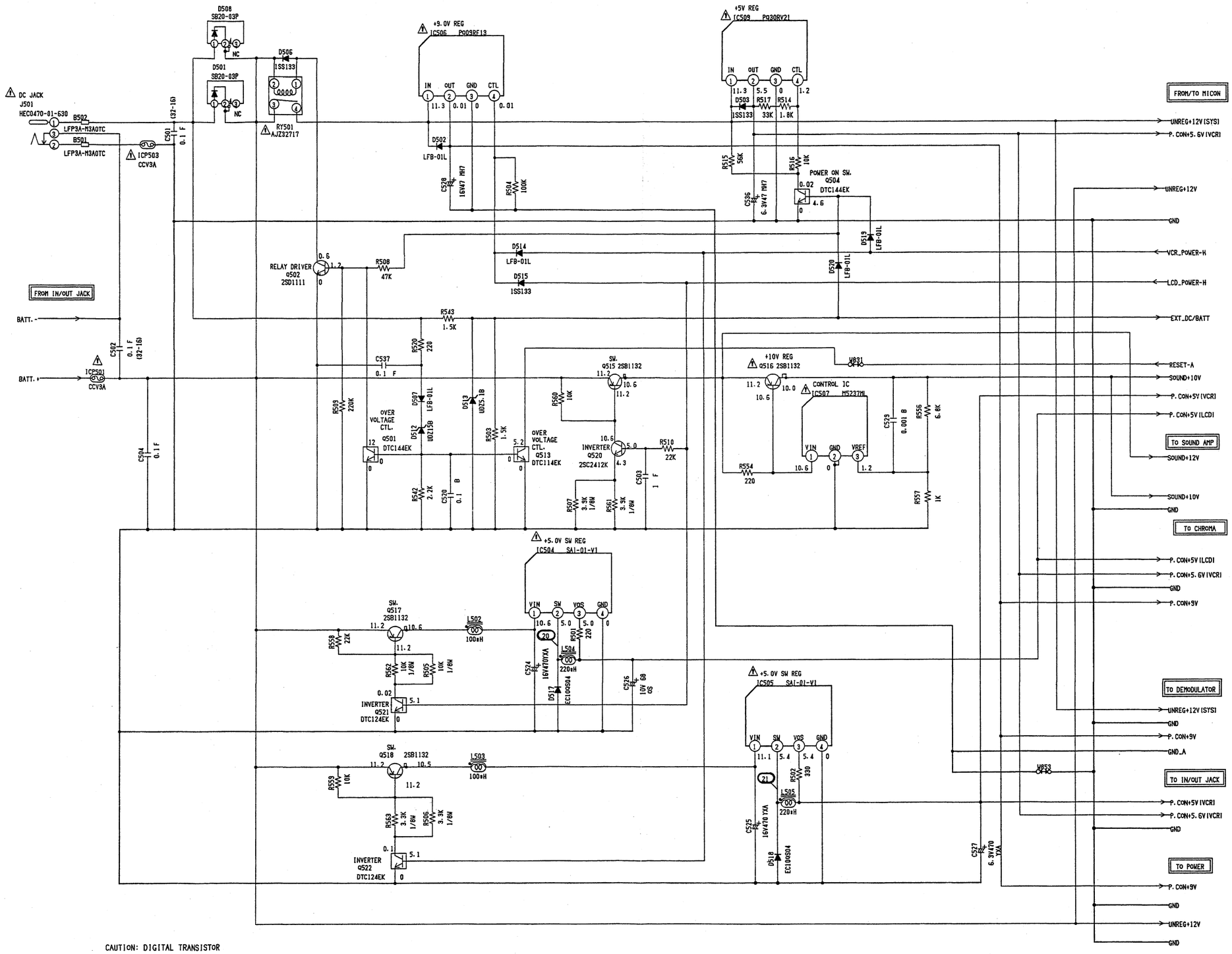
ATTENTION: LES PIECES REPAREES PAR UN ⚠ ÉTANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES .

CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY. USE ONES DESCRIBED IN PARTS LIST ONLY .

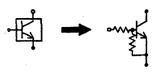
PCB240
TM7386

3-6509

REGULATE SCHEMATIC DIAGRAM



CAUTION: DIGITAL TRANSISTOR



ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES.

CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY. USE ONES DESCRIBED IN PARTS LIST ONLY.

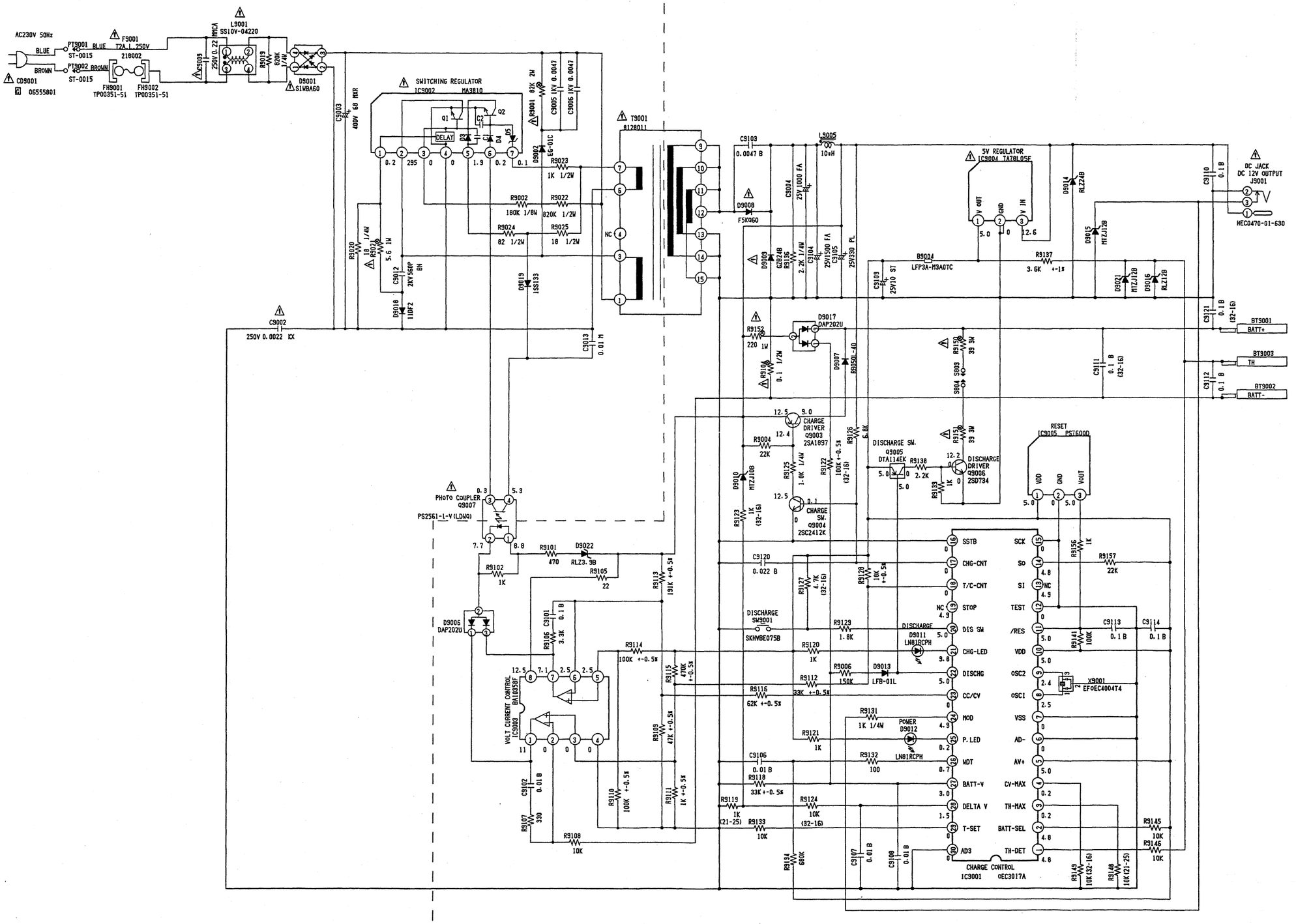
NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

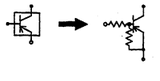
PCB240
TM7386

3-6510

AC ADAPTOR SCHEMATIC DIAGRAM



CAUTION: DIGITAL TRANSISTOR



CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.

ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES.

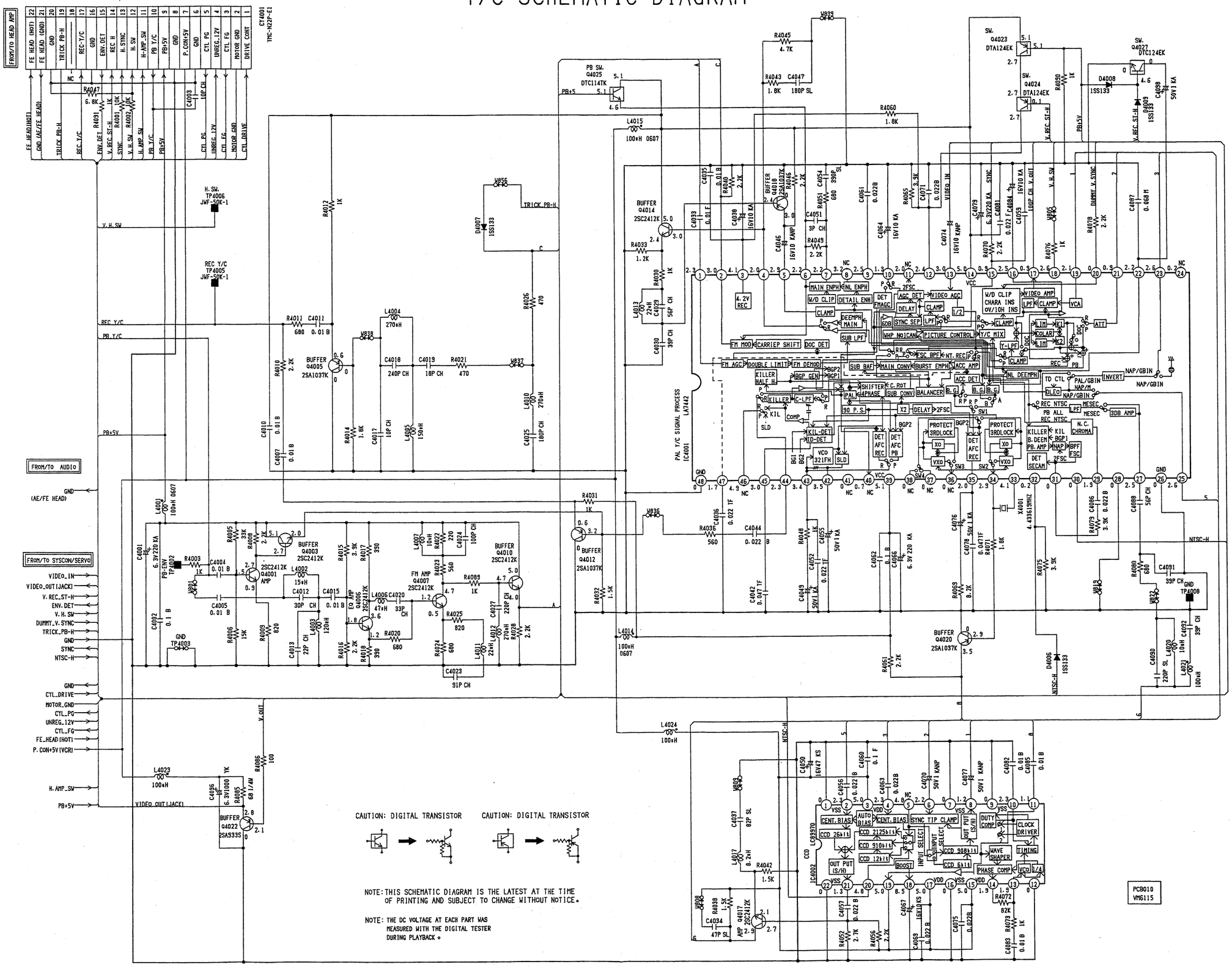
NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

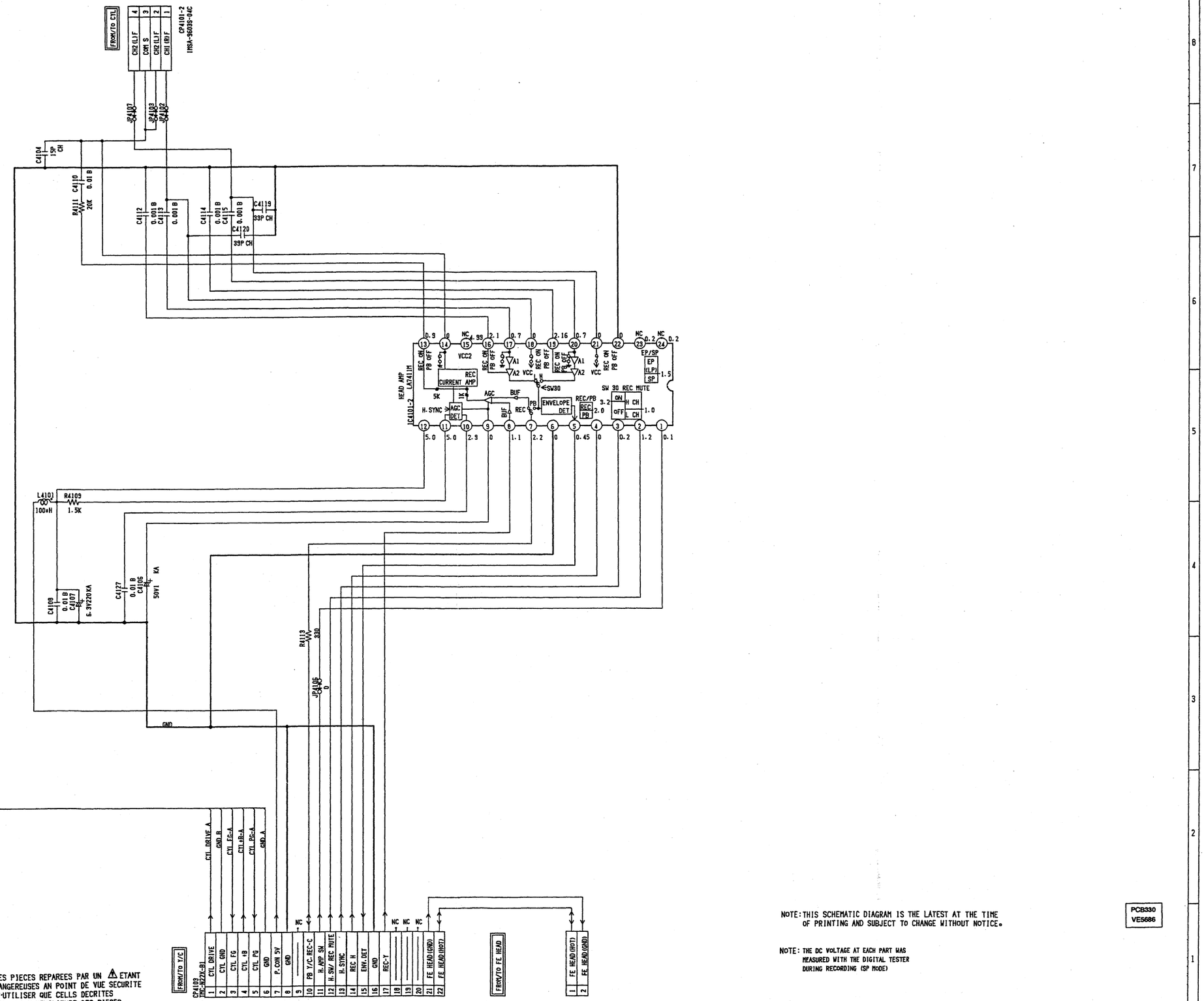
PCB390
TE6909

3-6511

Y/C SCHEMATIC DIAGRAM



HEAD AMP SCHEMATIC DIAGRAM



CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.

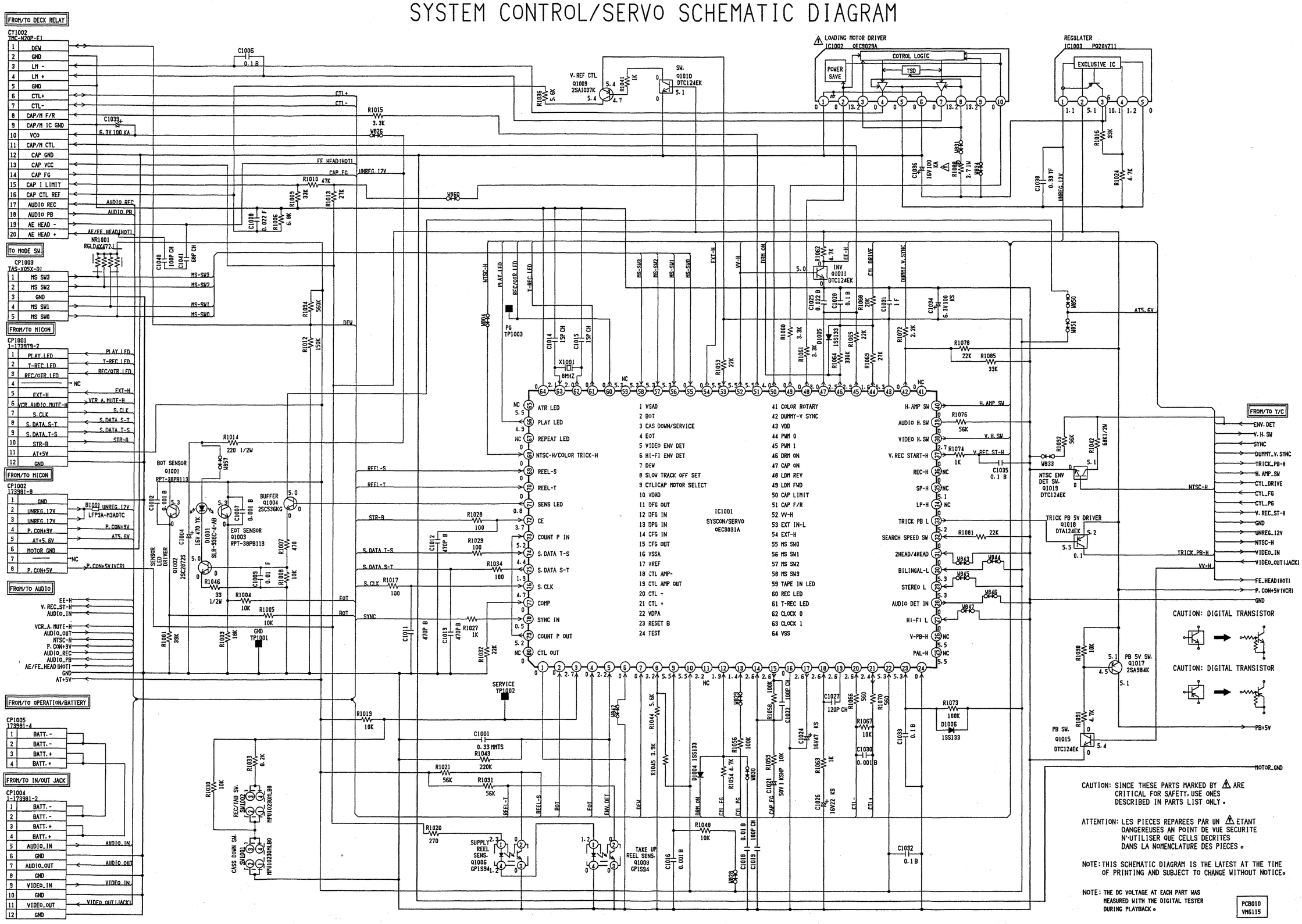
ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

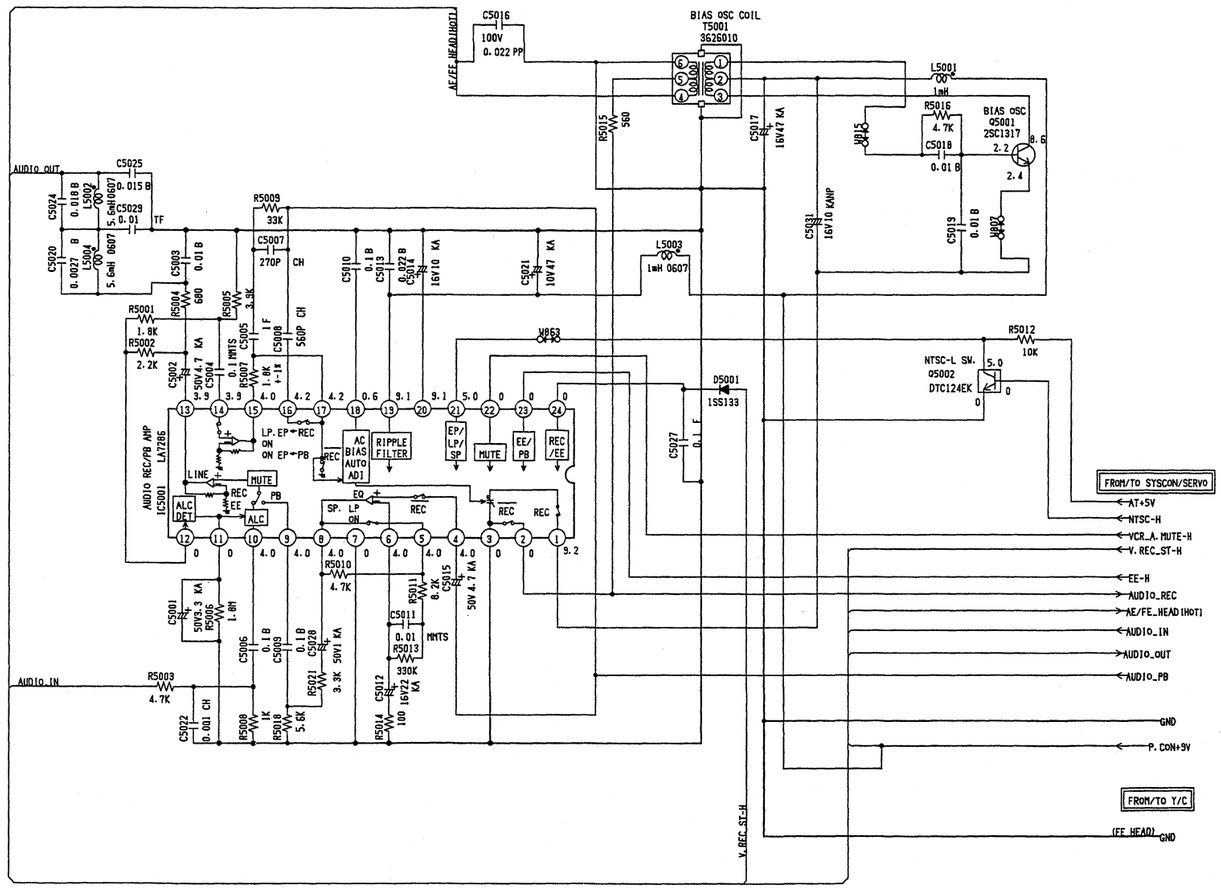
NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING RECORDING (SP MODE)

PCB330
VE5686

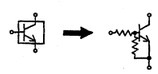
SYSTEM CONTROL/SERVO SCHEMATIC DIAGRAM



AUDIO SCHEMATIC DIAGRAM



CAUTION: DIGITAL TRANSISTOR

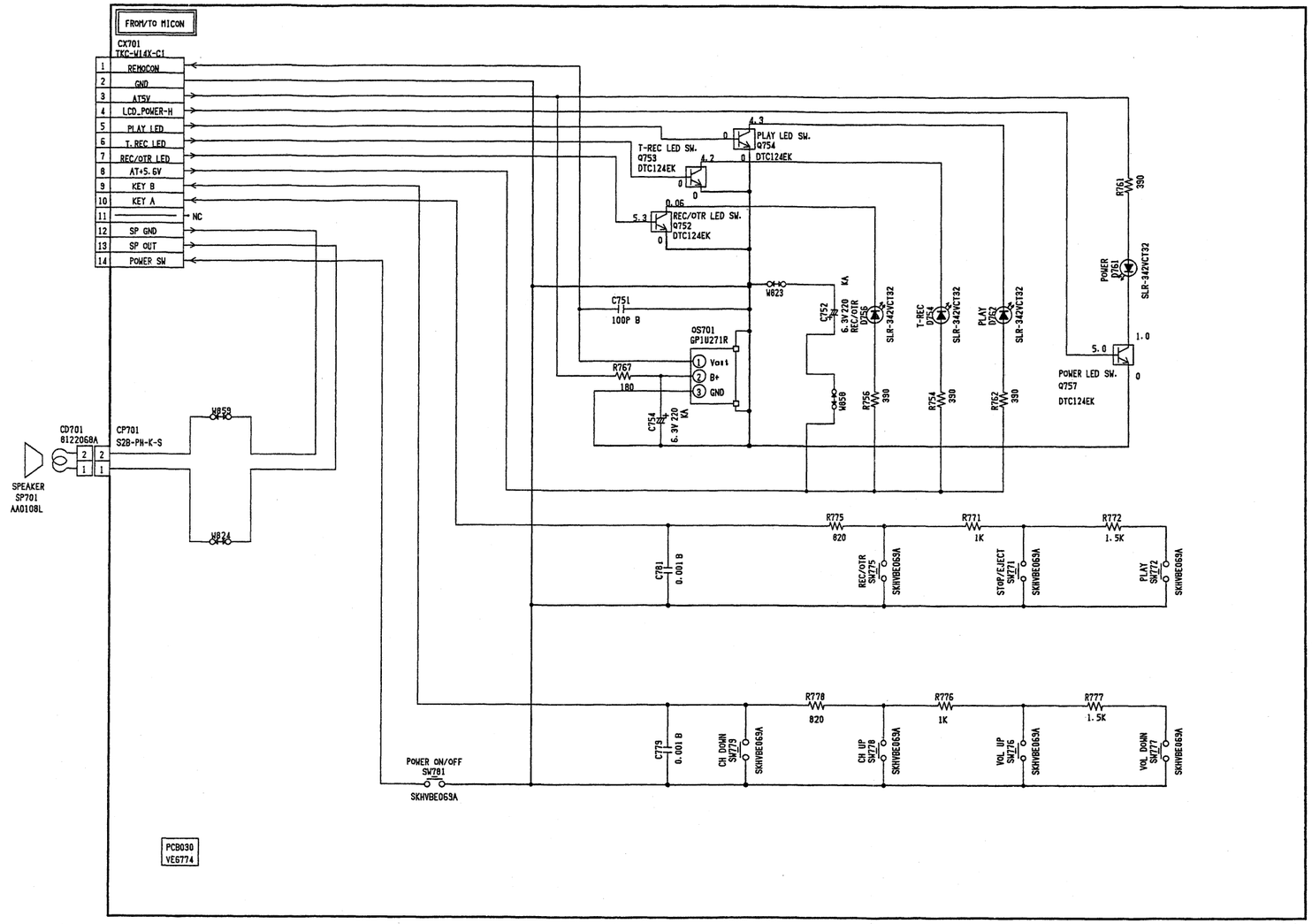


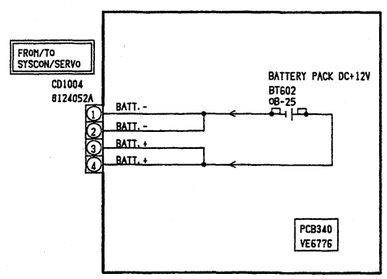
NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

PCB010
VM6115

OPERATION/BATTERY SCHEMATIC DIAGRAM

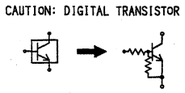




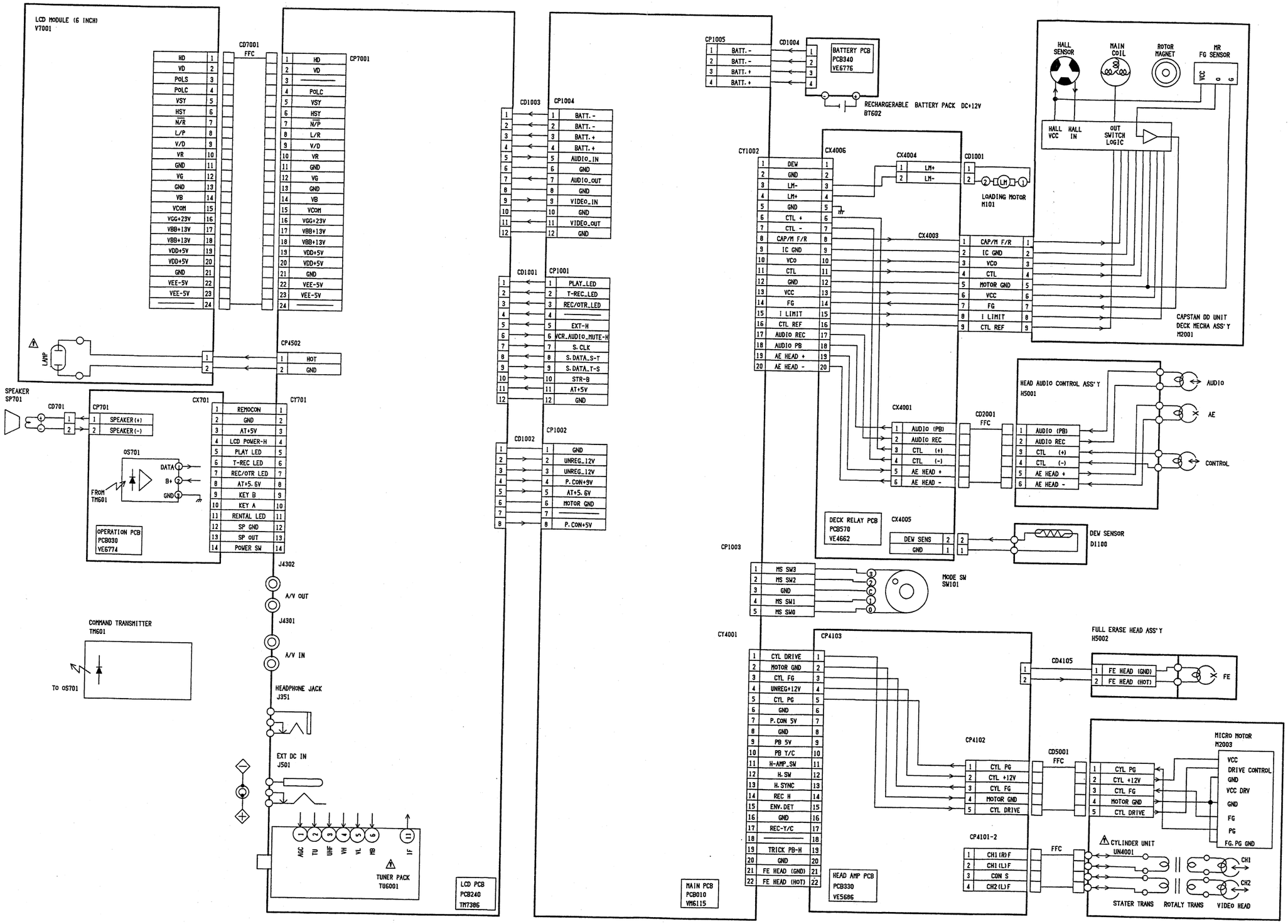
NOTE: THE DC VOLTAGE AT EACH PART WAS MEASURED WITH THE DIGITAL TESTER DURING PLAYBACK.

NOTE: THIS SCHEMATIC DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

CAUTION: DIGITAL TRANSISTOR



INTERCONNECTION DIAGRAM



CAUTION: SINCE THESE PARTS MARKED BY ⚠ ARE CRITICAL FOR SAFETY, USE ONES DESCRIBED IN PARTS LIST ONLY.

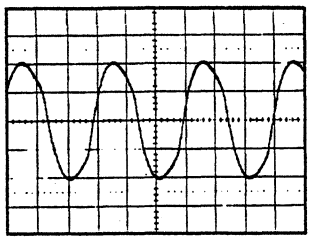
ATTENTION: LES PIECES REPAREES PAR UN ⚠ ETANT DANGEREUSES AN POINT DE VUE SECURITE N'UTILISER QUE CELLS DECRITES DANS LA NOMENCLATURE DES PIECES.

NOTE: THIS INTERCONNECTION DIAGRAM IS THE LATEST AT THE TIME OF PRINTING AND SUBJECT TO CHANGE WITHOUT NOTICE.

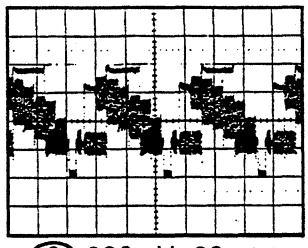
/IDE-V21578 / DRUCK23

WAVEFORMS

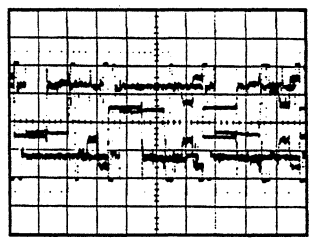
MICON



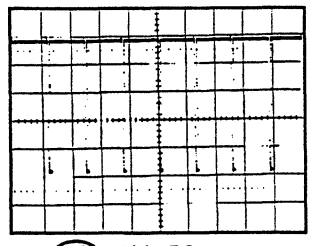
① 1V 10μs/div



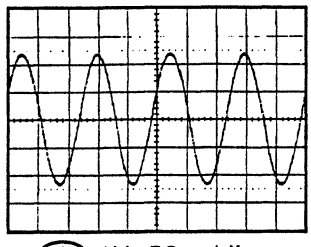
⑥ 200mV 20μs/div



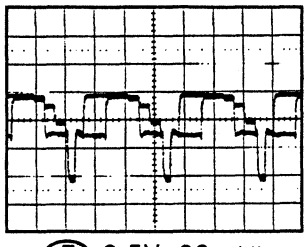
⑫ 2V 20μs/div



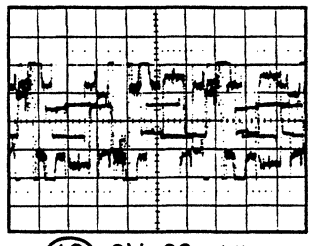
⑱ 1V 50μs/div



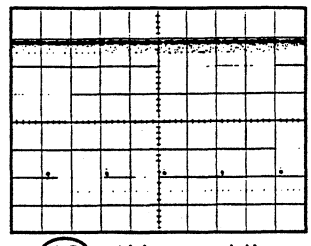
② 1V 50ns/div



⑦ 0.5V 20μs/div

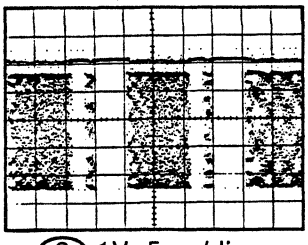


⑬ 2V 20μs/div

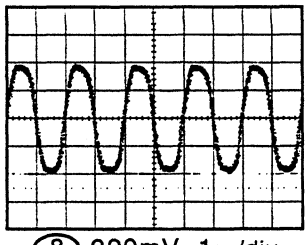


⑲ 1V 10ms/div

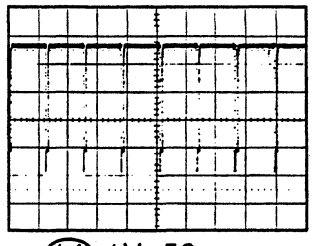
REGULATE



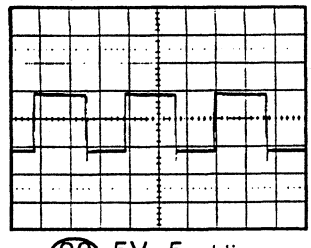
③ 1V 5ms/div



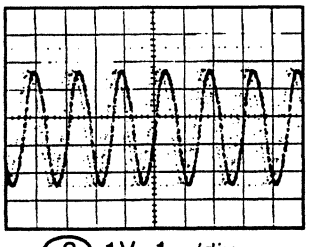
⑧ 200mV 1μs/div



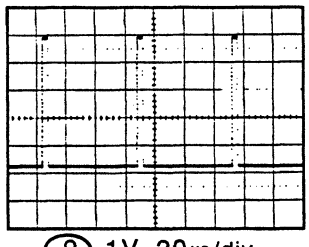
⑭ 1V 50μs/div



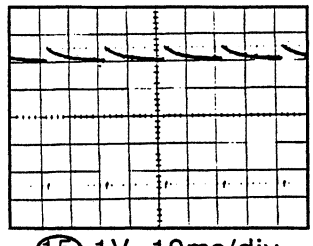
⑳ 5V 5μs/div



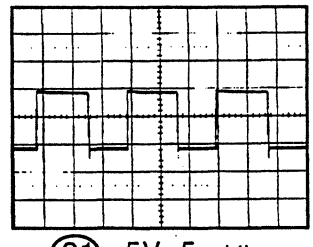
③ 1V 1μs/div



⑨ 1V 20μs/div

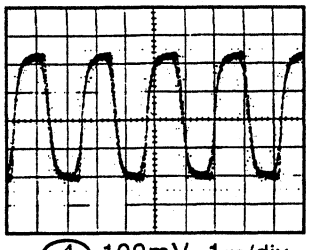


⑮ 1V 10ms/div

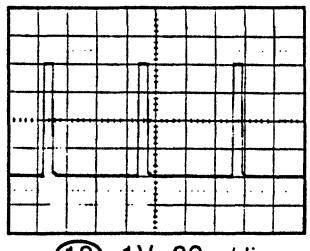


㉑ 5V 5μs/div

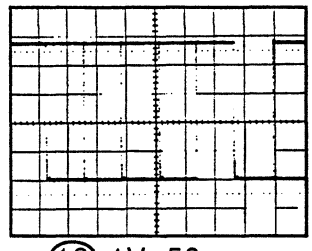
CHROMA



④ 100mV 1μs/div

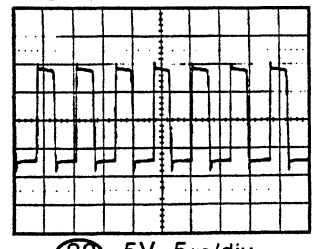


⑩ 1V 20μs/div

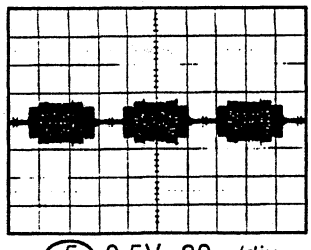


⑯ 1V 50μs/div

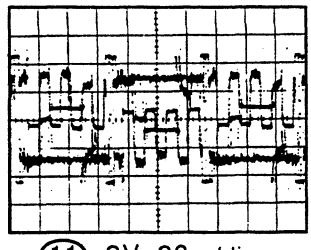
POWER



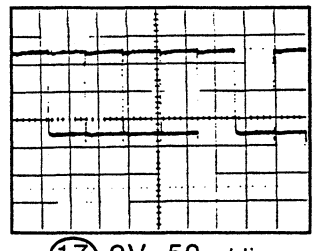
㉒ 5V 5μs/div



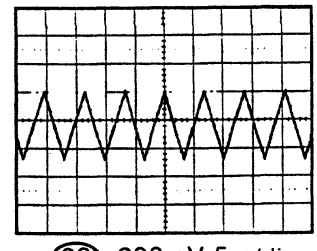
⑤ 0.5V 20μs/div



⑪ 2V 20μs/div



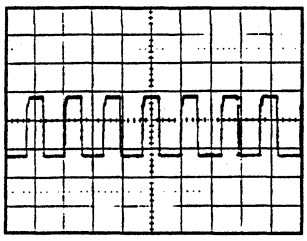
⑰ 2V 50μs/div



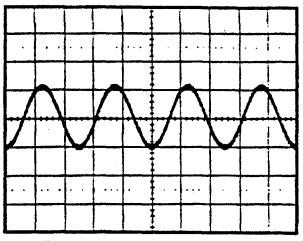
㉓ 200mV 5μs/div

NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

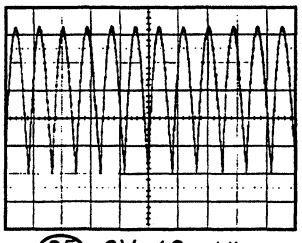
WAVEFORMS



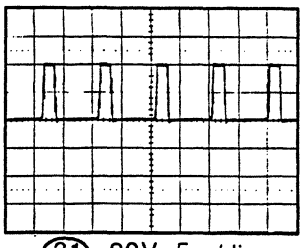
(24) 5V 5μs/div



(30) 200mV 1μs/div

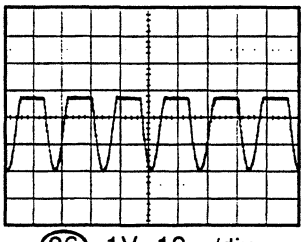


(25) 2V 10μs/div

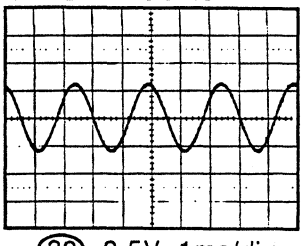


(31) 20V 5μs/div

SOUND AMP

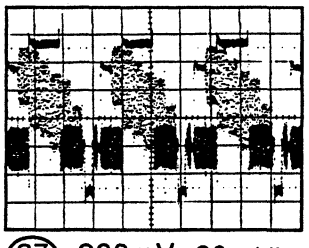


(26) 1V 10μs/div

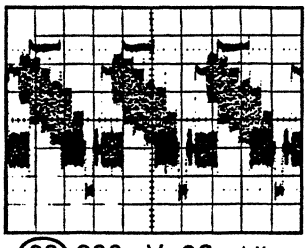


(32) 0.5V 1ms/div

IN/OUT JACK

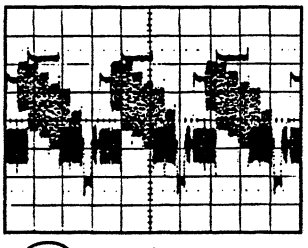


(27) 200mV 20μs/div



(28) 200mV 20μs/div

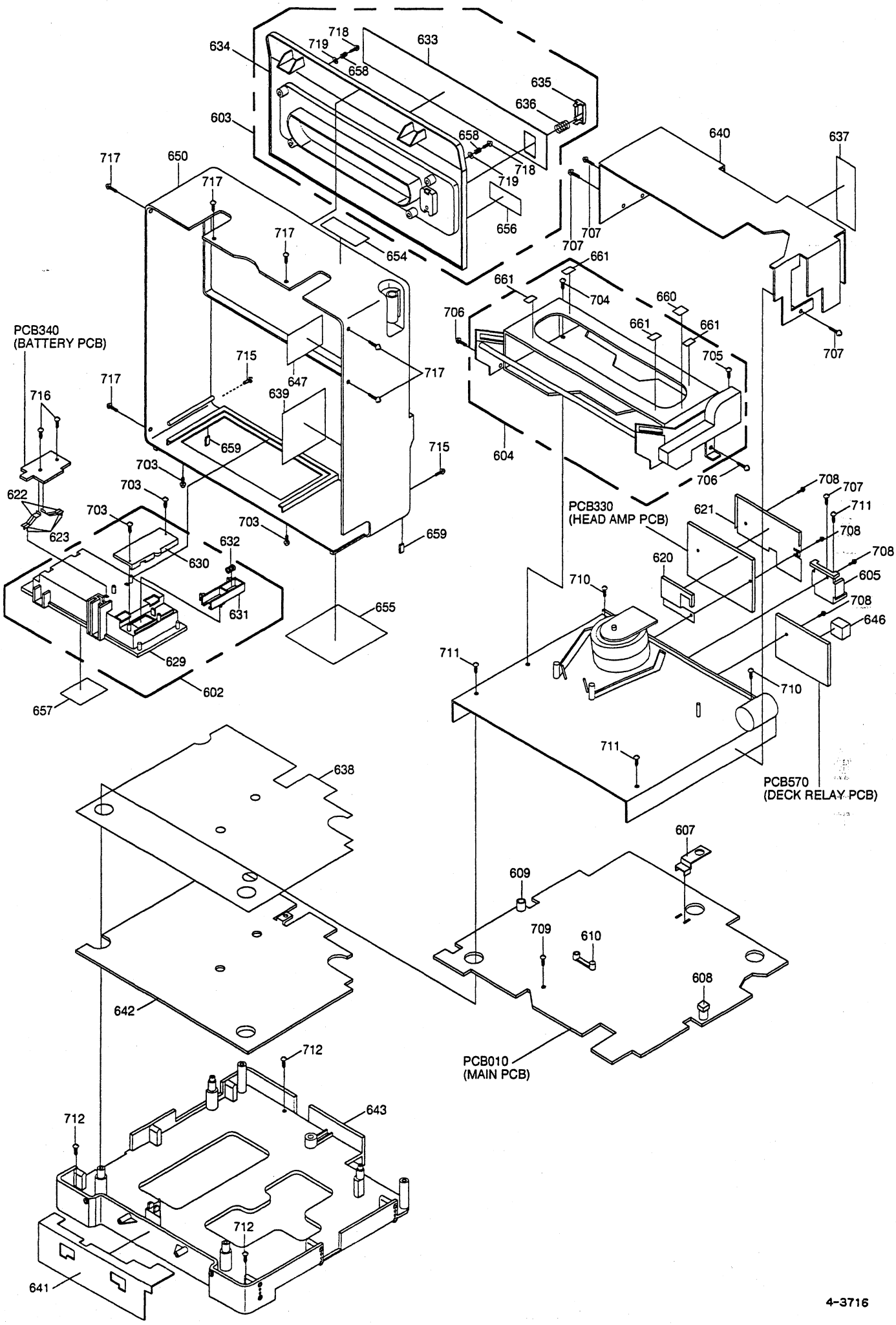
DEMODULATOR



(29) 0.5V 20μs/div

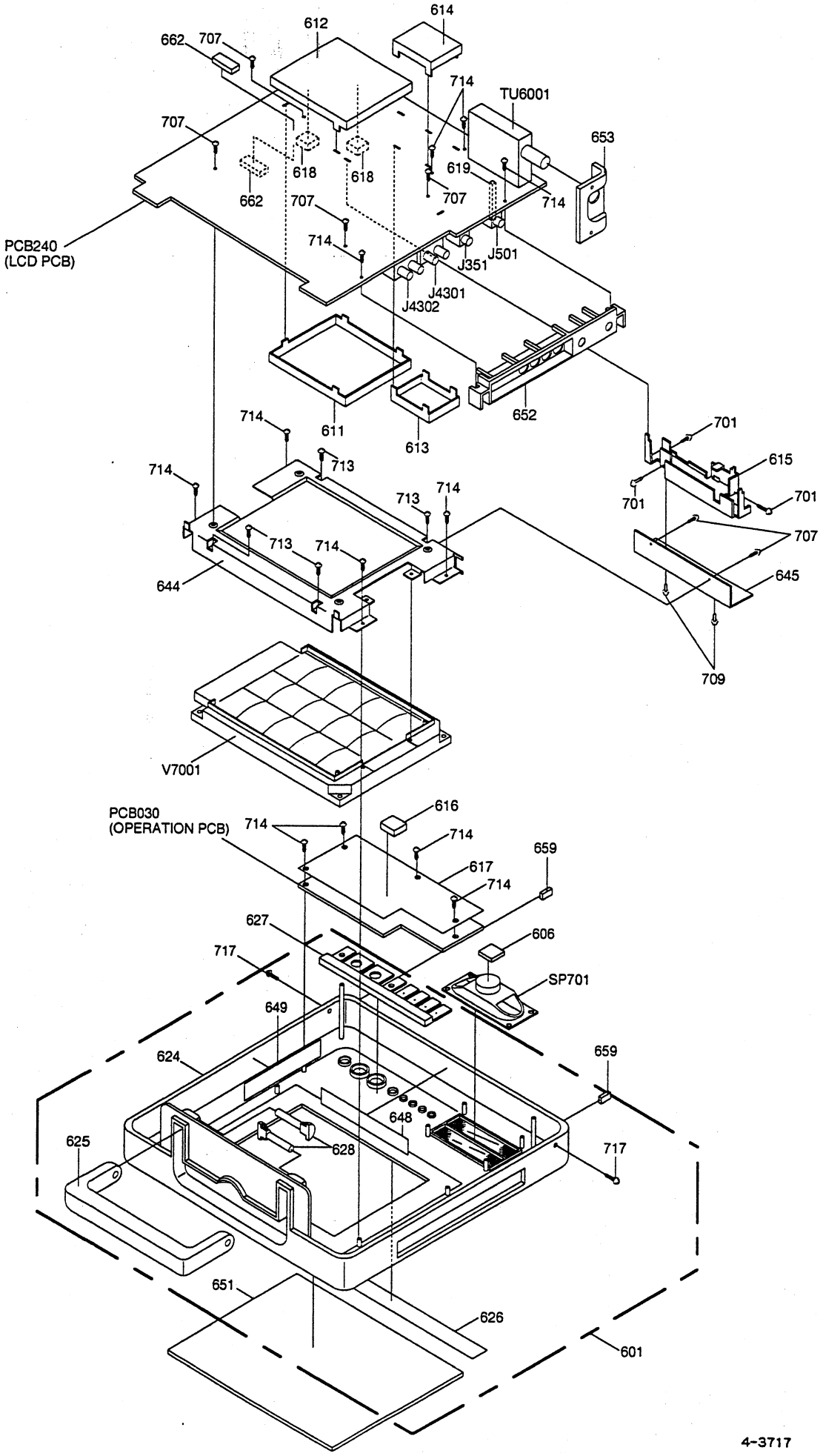
NOTE: The following waveforms were measured at the point of the corresponding balloon number in the schematic diagram.

MECHANICAL EXPLODED VIEW



4-3716

MECHANICAL EXPLODED VIEW



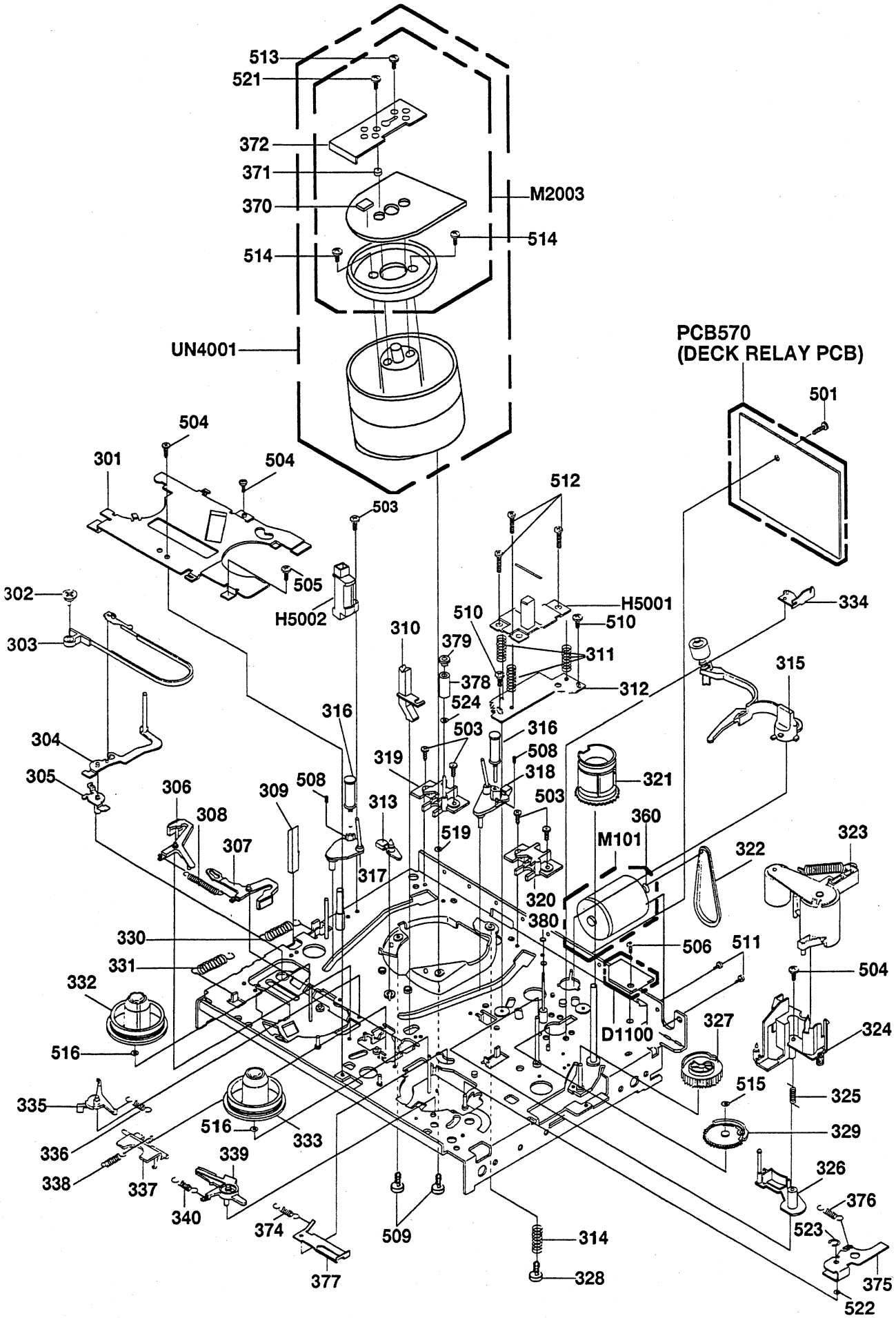
4-3717

MECHANICAL REPLACEMENT PARTS LIST

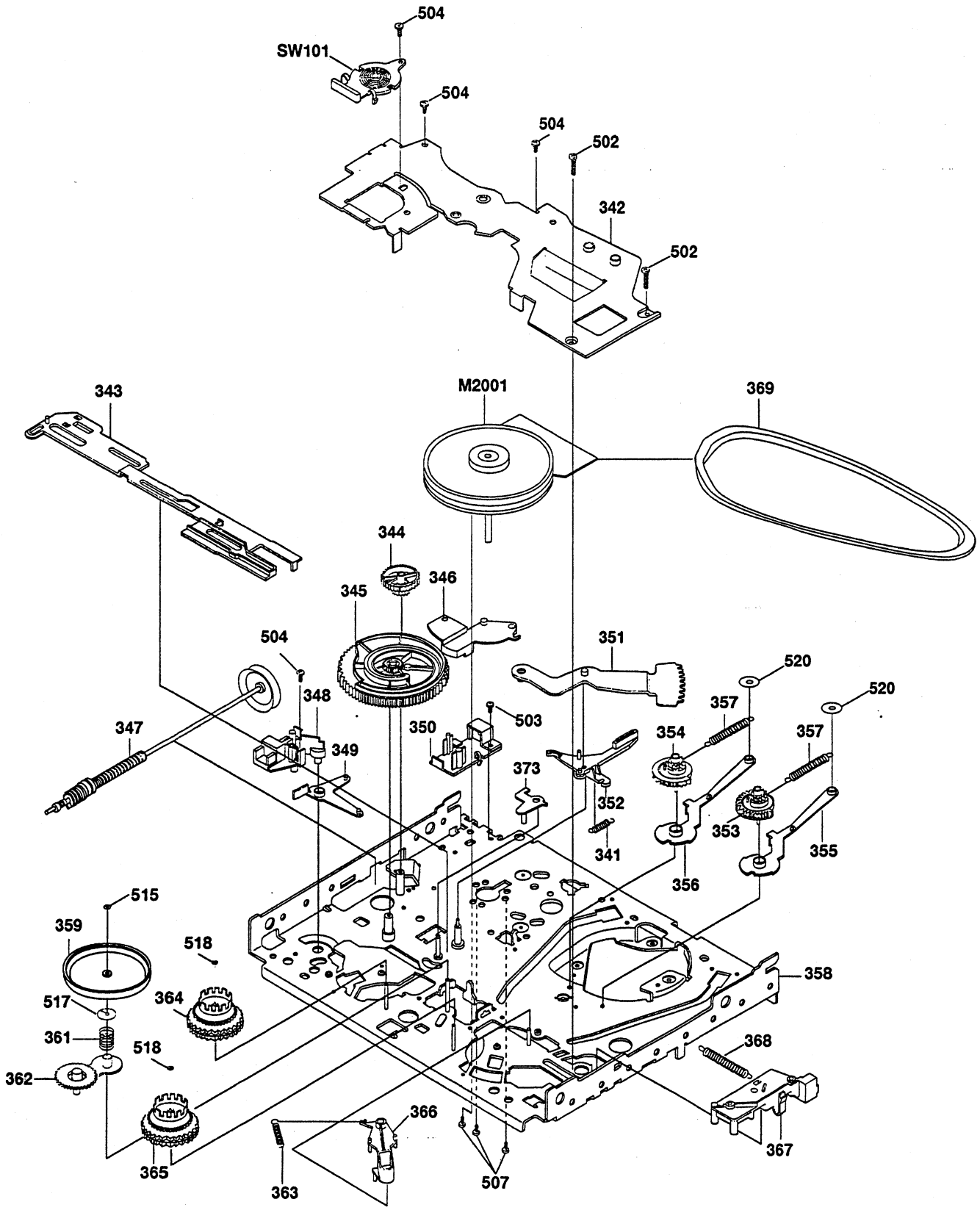
REF.NO.	PART NO.	DESCRIPTION
501	A53701A400	AC ADAPTOR ASS'Y
502	753WSA0059	SHIELD.MAIN(NO.1)
503	753WSA0060	SHIELD.MAIN(NO.2)
504	753WUA0044	SPRING.IC
505	753WUA0047	SPRING.BATTERY ASS'Y
506	800JR00080	CUSHION.CON 8*8*6T
507	701WPA0267	CABINET.TOP
508	702WPA0448	CABINET.BOTTOM
509	7222022409	SHEET.RATING(AD)
510	7230006513	PLATE.DISPLAY
511	800JRA0018	RUBBER.IC
601	A53701A720	CABINET.FRONT ASS'Y
602	A53701A730	CABINET.BACK ASS'Y
603	A53701A780	LID.CASSETTE ASS'Y
604	A53102A650	TOP LOADING (TL-4)
605	762WSA0024	ANGLE.DECK BACK
606	800JR00081	CUSHION.SPEAKER
607	753WSA0058	PLATE.EARTH SYSCON
608	754WPA0010	COVER.LED (R)
609	754WPA0011	COVER.LED (L)
610	850P700031	HOLDER.LED
611	752JSA0372	SHIELD.CASE DC/DC
612	752JSA0373	SHIELD.COVER DC/DC
613	752JSA0376	SHIELD.CASE IF
614	752JSA0377	SHIELD.COVER IF
615	----	HEAT SINK
616	800JF00166	CUSHION-A
617	800JF00218	SHEET.OPERATION
618	800JR00010	RUBBER.COIL
619	----	STYLE PIN
620	753WSA0055	SHIELD.CASE HEAD AMP
621	753WSA0075	COVER.HEAD AMP SHIELD
622	744JUD0001	SPRING.BATTERY
623	773JEA0002	PIN.BATTERY
624	701JPJ0914	CABINET.FRONT
625	705JPB0032	HANDLE
626	711JND0017	PLATE.DISPLAY
627	735JPA0590	BUTTON.DECK
628	769WPA0011	HANDLE HOLDER
629	703JPA0019	CABINET.BATTERY
630	703JPA0020	COVER.BATTERY
631	735JPA0592	KNOB.EJECT
632	742JUA0046	SPRING.EJECT
633	711JND0016	PLATE.WINDOW
634	712JPB0028	LID.CASSETTE
635	735JPA0593	BUTTON.STAGE
636	742JUA0048	SPRING STAGE
637	7230006261	SHEET.LCD 20*60
638	7230006445	SHEET.SYSCON
639	800JFQ0004	SHEET.BACK SIDE B

REF.NO.	PART NO.	DESCRIPTION
640	752JSA0378	SHIELD.DECK
641	752JSA0379	SHIELD.TOP
642	752JSA0380	SHIELD.SYSCON
643	761JPA0127	HOLDER.DECK
644	762JSA0086	BRACKET.LCD
645	763JSA0025	ANGLE
646	800JF00177	NEO SPONGE
647	800JFQ0003	SHEET.BACK SIDE A
648	800JFQ0002	SHEET.FRONT BOTTOM
649	800JFQ0001	SHEET.FRONT SIDE
650	702JPJ0075	CABINET.BACK
651	711JND0020	PLATE.ACRYL
652	711JPA0092	PLATE.JACK
653	711JPA0090	PLATE.TUNER
654	7220001081	SHEET.ANTENNA
655	7222022408	SHEET.RATING
656	7230006399	SHEET.LID CASSETTE
657	7240001109	SHEET.CAUTION.BATTERY(G)
658	742JUA0049	SPRING.LID
659	800JFA0038	CUSHION.LEG
660	800JNA0006	SHEET PVC 10*10*T0.5
661	800JQ00169	FELT SHEET 5*10*T0.5
662	800JF00204	CUSHION-C
701	8107230804	SCREW.TAP TITE(S) BIND 3*8
702	8110630A44	SCREW.TAP TITE(P) BRAZIER 3*14
703	8149120602	SCREW.TAP TITE(P) #0 P3 PAN 2*6
704	8107226504	SCREW.TAP TITE(S) BIND 2.6*5
705	8107126805	SCREW.TAP TITE(S) PAN 2.6*8
706	8107230404	SCREW.TAP TITE(S) BIND 3*4
707	8107230504	SCREW.TAP TITE(S) BIND 3*5
708	8107230604	SCREW.TAP TITE(S) BIND 3*6
709	8110330804	SCREW.TAP TITE(P) FLAT 3*8
710	8117D30A04	SCREW.TAPPING(B0) WH8 BRAZIER 3*10
711	8117140A24	SCREW.TAPPING(B0) PAN 4*12
712	8110130A44	SCREW.TAP TITE(P) PAN 3*14
713	8110220504	SCREW.TAP TITE(P) BIND 2*5
714	8110230A04	SCREW.TAP TITE(P) BIND 3*10
715	8110230A42	SCREW TAP TITE(P) BIND 3*14
716	8110230604	SCREW.TAP TITE(P) BIND 3*6
717	8110430A02	SCREW.TAP TITE(P) OVERL 3*10
718	8140117352	SCREW.CAMERA M1.7*0.35*3.5
719	82Q315403N	POLYSLIDER WASHER 3.1*5.4*T0.3
---	J2860202	GUARANTEE CARD
---	J5370101	INSTRUCTION BOOK
---	J5370107	QUICK SET-UP SHEET
---	792JHA0260	PACKAGE
---	793JCD2496	GIFT BOX

CHASSIS EXPLODED VIEW (TOP VIEW)



CHASSIS EXPLODED VIEW (BOTTOM VIEW)



CHASSIS REPLACEMENT PARTS LIST

REF.NO.	PART NO.	DESCRIPTION
301	850P600471	BRACKET,BRAKE
302	850P400358	ADJUST,TENSION
303	850A400122	TENSION BAND ASS'Y
304	850A400124	TENSION ARM ASS'Y
305	850A400123	TENSION LEVER 2 ASS'Y
306	850A600155	MAIN BRAKE S ASS'Y
307	850A600156	MAIN BRAKE T ASS'Y
308	850P800252	SPRING,MAIN BRAKE
309	850P900564	REFLECTOR,EOT
310	850P400411	REFLECTOR,LED 2
311	850P800269	SPRING,AC HEAD
312	850P500060	BASE,AC HEAD
313	850P000394	POST,CASS GUIDE L
314	850P800245	SPRING,AZIMUTH 2
315	850A500013	AHC ASS'Y
316	850A400102	GUIDE ROLLER ASS'Y
317	850A400126	BASE,S INCLINED ASS'Y
318	850A400127	BASE,T INCLINED ASS'Y
319	850A400149	S CATCHER ASS'Y
320	850P400401	CATCHER T
321	850P400343	CAM,PINCH ROLLER
322	850P600487	BELT,LOADING
323	850A400151	PINCH ROLLER BLOCK
324	850P900541	CASS,OPENER
325	850P800264	SPRING,P5
326	850A400120	P5 ARM ASS'Y
327	850P400342	CAM GEAR
328	8146230A14	JOINT SCREW BIND M3*11
329	850P400344	CAM,P5
330	850P400356	SPRING,TENSION ARM 2
331	850P400357	SPRING,TENSION ARM 1
332	850P200216	REEL S
333	850P200217	REEL T
334	850P400402	CATCHER,P5 2
335	850P600465	SUB BRAKE S
336	850P800253	SPRING,S-S BRAKE
337	850P200247	ARM,JOINT
338	850P800262	SPRING,JOINT ARM
339	850A600157	SUB BRAKE T ASS'Y
340	850P800254	SPRING,T-S BRAKE
341	850P800255	SPRING,CAP BRAKE
342	850P600485	PLATE,BOTTOM
343	850A600176	ROD,MAIN ASS'Y
344	850P400341	GEAR,MIDDLE
345	850P600472	CAM,MAIN
346	850P600468	LEVER,MAIN BRAKE
347	850A600159	WORM ASS'Y
348	850P600483	BRACKET,WORM F
349	850P600474	LEVER,RATCHET
350	850P600484	BRACKET,WORM R
351	850P300151	LEVER,LOADING
352	850A600174	CAPSTAN BRAKE ASS'Y (M.J)
353	850P300152	GEAR,LOADING S
354	850P300153	GEAR,LOADING T
355	850A300053	LOADING ARM S ASS'Y
356	850A300054	LOADING ARM T ASS'Y
357	850P800263	SPRING,LOADING GEAR
358	850A000221	MAIN CHASSIS ASS'Y
359	850P200213	CENTER PULLEY
360	850P600486	PULLEY,LDM 5
361	850P800261	SPRING,C-PULLEY
362	850A200061	ARM IDLER ASSY 2
363	850P800270	SPRING,LEVER TENSION
364	850A200064	CLUTCH GEAR T ASS'Y
365	850A200063	CLUTCH GEAR S ASS'Y
366	850P400360	LEVER,TENSION
367	850P400359	HOLDER,TENSION
368	850P800256	SPRING,MAIN ROD
369	850P200215	BELT,CAPSTAN

REF.NO.	PART NO.	DESCRIPTION
370	800JF00212	CUSHION-D
371	850PAA0266	COLLAR SHIELD
372	850PAA0281	TAPE GUIDE
373	850P400365	PINION,TENSION 3
374	850P800266	SPRING,LEVER TENSION 3
375	850A400152	TENSION ARM 3 (LCD) ASS'Y
376	850P800305	SPRING,TENSION ARM 3 (LCD)
377	850P400364	LEVER,TENSION 3
378	850P400367	ROLLER,IMPEDANCE
379	850P400420	CAP,IMPEDANCE
380	850P400421	CAP,P4
501	8107230604	SCREW,TAP TITE(S) BIND 3*6
502	8109226A64	SCREW,TAP TITE(B) BIND 2.6*16
503	8107226804	SCREW,TAP TITE(S) BIND 2.6*8
504	8107226604	SCREW,TAP TITE(S) BIND 2.6*6
505	8107123604	SCREW,TAP TITE(S) PAN 2.3*6
506	8107226404	SCREW,TAP TITE(S) BIND 2.6*4
507	8109126804	SCREW,TAP TITE(B)PAN 2.6*8
508	815DJ20302	SET SCREW 6 CUP POINT M2*3
509	810A130604	SCREW/WASHER(A) M3*6
510	810B126604	SCREW/WASHER(B) M2.6*6.0
511	8102130304	SCREW,PAN M3.0*3.0
512	8102126A04	SCREW,PAN M2.6*10
513	810A123504	SEMS A M2.3*5.0
514	850PAA0197	SCREW,MOTOR M3*5
515	82P266005N	POLYSLIDER WASHER(CUT) 2.6*6.0*T0.5
516	82Q264713N	POLYSLIDER WASHER 2.6*4.7*T0.13
517	82P26A005N	POLYSLIDER WASHER(CUT) 2.6*10*T0.5
518	82P166005N	POLYSLIDER WASHER(CUT) 1.6*6.0*T0.5
519	82Q3154B3N	POLYSLIDER WASHER 3.1*5.4*T0.13
520	83CST40000	CS-RING 4.0
521	810A123604	SCREW/WASHER(A) M2.3*6.0
522	82Q518004N	POLYSLIDER WASHER 5.1*8.0*T0.4
523	83ETW25000	E-RING 2.5
524	82Q214005N	POLYSLIDER WASHER 2.1*4.0*T0.5
CD1001	068722058A	CORD EIS CONNECTOR 8722058A
CD2001	122W060803	CORD JUMPER 2W060803
CD5001	122L050901	CORD JUMPER 2L050901
CX4001	069R760018	CONNECTOR PCB SIDE 52044-0645
CX4003	069779M010	CONNECTOR PCB SIDE TKC-F09X-L1
CX4004	0694220139	CONNECTOR PCB SIDE 173979-2
CX4005	069R240519	CONNECTOR PCB SIDE 52288-0211
CX4006	0697FK0080	CONNECTOR PCB SIDE TMC-N20X-B1
D1100	DAK0000150	DEW SENSOR HDP-05-C8
H5001	1523D91029	HEAD,AUDIO CONTROL HVMZA1254A
H5002	1543D02011	HEAD,FULL ERASE HVFHF0060A
M101	1596P48001	MOTOR,LOADING MXN-13FB09C
M2001	1594J98003	CAPSTAN DD UNIT SP39BC
M2003	1589V11004	MICRO MOTOR EP14BA
SW101	0520244003	MODE SWITCH SRZZ0B064A
PCB570	A51101A570	DECK RELAY PCB ASS'Y VE4662
⚠ UN4001	A53102A500	CYLINDER UNIT ASS'Y A53102A500

THIS ELECTRICAL PARTS LIST IS STANDARD PART LIST, BUT
INTERCHANGEABLE PARTS MAY BE USED IN THE UNIT.
SEE THE INTERCHANGEABLE PARTS LIST AFTER THE STANDARD PARTS LIST.

ELECTRICAL REPLACEMENT PARTS LIST

REF.NO.	PART NO.	DESCRIPTION	
RESISTORS			
⚠ R1088	R615812R7J	R.FUSE	2.7 OHM 1W
R4047	R00106682J	RC	6.8K OHM 1/6W
⚠ R9001	R3228A823J	R.METAL OXIDE	82K OHM 2W
⚠ R9021	R311815R6J	R.METAL	5.6 OHM 1W
⚠ R9104	R336U20R1J	R.METAL	0.1 OHM 1/2W
⚠ R9150	R3148B390J	R.METAL	39 OHM 3W
⚠ R9151	R3148B390J	R.METAL	39 OHM 3W
⚠ R9152	R31281221J	R.METAL OXIDE	220 OHM 1W
CAPACITORS			
C146	E02L00102M	CE	1000 UF 6.3V
C4531	E02Y03222M	CE	2200 UF 25V
⚠ C9002	CB3730MH3M	CC	0.0022UF 250V
C9003	E52SFH680M	CE	68 UF 400V
C9004	E01D03102M	CE	1000 UF 25V
C9005	C0370R6Q3K	CC	4700 PF 1KV R
C9006	C0370R6Q3K	CC	4700 PF 1KV R
⚠ C9009	P2222B224K	CMP	0.22 UF 250V AC
C9012	C030BN7S2K	CC	560 PF 2KV BN
C9104	E01D03152M	CE	1500 UF 25V
SEMICONDUCTORS			
D101	D28TEQS040	DIODE,SCHOTTKY	11EQS04TA1B2
D102	D97U01501B	DIODE,ZENER	MTZJ15B T-77
D103	D1VT001330	DIODE,SILICON	1SS133T-77
D105	D97U05R61B	DIODE,ZENER	MTZJ5.6B T-77
D106	D1VT001330	DIODE,SILICON	1SS133T-77
D107	D97U08R21B	DIODE,ZENER	MTZJ8.2B T-77
D108	DD3RLFB01L	DIODE,SILICON	LFB-01L
D109	D1VT001330	DIODE,SILICON	1SS133T-77
D110	DD7RN202U0	DIODE,SILICON	DAN202UT107
D111	DD7TR202U0	DIODE,SILICON	DAP202UT107
D112	DD3RLFB01L	DIODE,SILICON	LFB-01L
D115	D28TEQS040	DIODE,SCHOTTKY	11EQS04TA1B2
D351	D97U01801B	DIODE,ZENER	MTZJ18B T-77
D353	D97U01301B	DIODE,ZENER	MTZJ13B T-77
D501	DD3RB2003P	DIODE,SILICON	SB20-03P-TD
D502	DD3RLFB01L	DIODE,SILICON	LFB-01L
D503	D1VT001330	DIODE,SILICON	1SS133T-77
D506	D1VT001330	DIODE,SILICON	1SS133T-77
D507	DD3RLFB01L	DIODE,SILICON	LFB-01L
D508	DD3RB2003P	DIODE,SILICON	SB20-03P-TD
D512	DE7RB15020	DIODE,ZENER	UDZ15B
D513	DE7RB5R120	DIODE,ZENER	UDZ5R1B
D514	DD3RLFB01L	DIODE,SILICON	LFB-01L
D515	D1VT001330	DIODE,SILICON	1SS133T-77
D517	DD8R10QS04	D.,SCHOTTKY BARRIER	EC10QS04-TE12R
D518	DD8R10QS04	D.,SCHOTTKY BARRIER	EC10QS04-TE12R
D519	DD3RLFB01L	DIODE,SILICON	LFB-01L
D520	DD3RLFB01L	DIODE,SILICON	LFB-01L
D754	0021721150	LED	SLR-342VCT32
D756	0021721150	LED	SLR-342VCT32
D761	0021721150	LED	SLR-342VCT32
D762	0021721150	LED	SLR-342VCT32
D1001	0001300030	LED	SLR-938C-4-AB
D1004	D1VT001330	DIODE,SILICON	1SS133T-77
D1005	D1VT001330	DIODE,SILICON	1SS133T-77
D1006	D1VT001330	DIODE,SILICON	1SS133T-77
D4006	D1VT001330	DIODE,SILICON	1SS133T-77
D4007	D1VT001330	DIODE,SILICON	1SS133T-77
D4008	D1VT001330	DIODE,SILICON	1SS133T-77
D4009	D1VT001330	DIODE,SILICON	1SS133T-77
D4301	D97U01301B	DIODE,ZENER	MTZJ13B T-77
D4302	D97U06R81B	DIODE,ZENER	MTZJ6.8B T-77
D4303	DE7RB13020	DIODE,ZENER	UDZ130B
D4501	DD8R10QS04	D.,SCHOTTKY BARRIER	EC10QS04-TE12R
D4502	D17R000920	DIODE,SILICON	RLS-92 TE-11
D4503	DD3R0505CP	DIODE,SILICON	SB05-05CP-TB
D4504	D17R000920	DIODE,SILICON	RLS-92 TE-11
D5001	D1VT001330	DIODE,SILICON	1SS133T-77
D6001	D9JTA33010	DIODE,ZENER	UZT33M-TA
D6002	D1VT001330	DIODE,SILICON	1SS133T-77
D6003	DD3RLFB01L	DIODE,SILICON	LFB-01L
D7001	D1VT001330	DIODE,SILICON	1SS133T-77
⚠ D9001	D2Z0S1WBA0	DIODE,S1WBA60	S1WBA60
D9002	D2BT0EG01C	DIODE,RECTIFER	EG-01C
D9006	DD7TR202U0	DIODE,SILICON	DAP202UT107
D9007	DD7RB050L0	DIODE,SILICON	RB050L-40
⚠ D9008	D28A000600	DIODE,SILICON	F5KQ60
⚠ D9009	D93012401B	DIODE,ZENER	GZB24B
D9010	D97U01001B	DIODE,ZENER	MTZJ10B T-77
D9011	0021120050	LED	LN81RCPH-(TA2)

REF.NO.	PART NO.	DESCRIPTION	
SEMICONDUCTORS (CONT.)			
D9012	0021120050	LED	LN81RCPH-(TA2)
D9013	DD3RLFB01L	DIODE,SILICON	LFB-01L
D9014	DE7RA2400B	DIODE,ZENER	RLZ24B TE-11
D9015	D97U01201B	DIODE,ZENER	MTZJ12B T-77
D9016	DE7RA1200B	DIODE,ZENER	RLZ12B TE-11
D9017	DD7TR202U0	DIODE,SILICON	DAP202UT107
D9018	D28T11DF20	DIODE,SILICON	11DF2-TA2B2
D9019	D1VT001330	DIODE,SILICON	1SS133T-77
D9021	D97U01201B	DIODE,ZENER	MTZJ12B T-77
D9022	DE7RA03R9B	DIODE,ZENER	RLZ3.9B TE-11
IC101	I55D06042A	IC	OEC6042A
IC102	IC3D0C04F0	IC	ST24C04FB6
IC103	I0UJ0T600H	IC	PST600HMT
IC104	I5HF01350H	IC	S-81350-HG-KD-X
⚠ IC351	I01SP52650	IC	AN5265
⚠ IC504	I0BF9AI010	IC	SAI-01-V1
⚠ IC505	I0BF9AI010	IC	SAI-01-V1
⚠ IC506	I0GA99RF13	IC	PQ09RF13
⚠ IC507	I06J95237M	IC	M5237ML
⚠ IC509	I0GA9RV210	IC	PQ30RV21
IC1001	I57F59031A	IC	OEC9031A
⚠ IC1002	I07S09029A	IC	OEC9029A
IC1003	I0GF9VZ110	IC	PQ20VZ11
IC4001	I03D374420	IC	LA7442
IC4002	I53D399T00	IC	LC89970
IC4101	I03FG7411M	IC	LA7411M-TP-T
IC4301	I03S071510	IC	LA7151
IC4501	I07F097430	IC	BA9743AFV
IC5001	I03D772860	IC	LA7286
IC6001	I03F071050	IC	LA7105M-TP-T1
IC6002	I03F06358N	IC	LA6358NML-TP-T1
IC6003	I06DA52342	IC	M52342SP
IC6004	I0GA99RF13	IC	PQ09RF13
IC6005	I07F061610	IC	BA6161F-E2
IC7001	I0GFCY18A0	IC	IR3Y18A
IC7002	I07F00226F	IC	BA226F-T1
IC7003	I03F07217M	IC	LA7217M-TRM
IC7005	I55FC7W140	IC	TC7W14FU
IC9001	I53F93017A	IC	OEC3017A
⚠ IC9002	I15S938100	IC	MA3810
IC9003	I07F00358F	IC	BA10358F-E1
⚠ IC9004	I05F08L05F	IC	TA78L05F
IC9005	I9UJ0T600D	IC	PST600D
Q101	T85A02883Y	TRANSISTOR,SILICON	2SC2883 Y
Q102	TP7TC05001	COMPOUND TRANSISTOR	DTA124EKT147
Q103	T87A2412K0	TRANSISTOR,SILICON	2SC2412KT147
Q104	T87A2412K0	TRANSISTOR,SILICON	2SC2412KT147
Q105	TN7TD05001	COMPOUND TRANSISTOR	DTC144EKT147
Q106	TP7TD05001	COMPOUND TRANSISTOR	DTA144EKT147
Q501	TN7TD05001	COMPOUND TRANSISTOR	DTC144EKT147
Q502	TD3T011110	TRANSISTOR,SILICON	2SD1111-AA
Q504	TN7TD05001	COMPOUND TRANSISTOR	DTC144EKT147
Q513	TN7TB05001	COMPOUND TRANSISTOR	DTC114EKT147
Q515	T77A011320	TRANSISTOR,SILICON	2SB1132T101
⚠ Q516	T77A011320	TRANSISTOR,SILICON	2SB1132T101
Q517	T77A011320	TRANSISTOR,SILICON	2SB1132T101
Q518	T77A011320	TRANSISTOR,SILICON	2SB1132T101
Q520	T87A2412K0	TRANSISTOR,SILICON	2SC2412KT147
Q521	TN7TC05001	COMPOUND TRANSISTOR	DTC124EKT147
Q522	TN7TC05001	COMPOUND TRANSISTOR	DTC124EKT147
Q752	TN7TC05001	COMPOUND TRANSISTOR	DTC124EKT147
Q753	TN7TC05001	COMPOUND TRANSISTOR	DTC124EKT147
Q754	TN7TC05001	COMPOUND TRANSISTOR	DTC124EKT147
Q757	TN7TC05001	COMPOUND TRANSISTOR	DTC124EKT147
Q1001	0000700320	TRANSISTOR,PHOTO	RPT-38PB113
Q1002	TCYT2872S0	TRANSISTOR,SILICON	2SC2872S
Q1003	0000700320	TRANSISTOR,PHOTO	RPT-38PB113
Q1004	TC3T0536KG	TRANSISTOR,SILICON	2SC536KG-NP-AA
Q1006	0002G00490	PHOTO COUPLER	GP1S94
Q1008	0002G00490	PHOTO COUPLER	GP1S94
Q1009	T67A1037K0	TRANSISTOR,SILICON	2SA1037KT147
Q1010	TN7TC05001	COMPOUND TRANSISTOR	DTC124EKT147
Q1011	TN7TC05001	COMPOUND TRANSISTOR	DTC124EKT147
Q1015	TN7TC05001	COMPOUND TRANSISTOR	DTC124EKT147
Q1017	TA3T0984K0	TRANSISTOR,SILICON	2SA984K-AA
Q1018	TP7TC05001	COMPOUND TRANSISTOR	DTA124EKT147
Q1019	TN7TC05001	COMPOUND TRANSISTOR	DTC124EKT147
Q4001	T87A2412K0	TRANSISTOR,SILICON	2SC2412KT147
Q4003	T87A2412K0	TRANSISTOR,SILICON	2SC2412KT147
Q4005	T67A1037K0	TRANSISTOR,SILICON	2SA1037KT147
Q4006	T87A2412K0	TRANSISTOR,SILICON	2SC2412KT147
Q4007	T87A2412K0	TRANSISTOR,SILICON	2SC2412KT147
Q4010	T87A2412K0	TRANSISTOR,SILICON	2SC2412KT147

ELECTRICAL REPLACEMENT PARTS LIST

REF.NO.	PART NO.	DESCRIPTION
		SEMICONDUCTORS (CONT.)
Q4012	T67A1037K0	TRANSISTOR,SILICON 2SA1037KT147
Q4014	T87A2412K0	TRANSISTOR,SILICON 2SC2412KT147
Q4017	T87A2412K0	TRANSISTOR,SILICON 2SC2412KT147
Q4018	T67A1037K0	TRANSISTOR,SILICON 2SA1037KT147
Q4020	T67A1037K0	TRANSISTOR,SILICON 2SA1037KT147
Q4022	TA7T0933S0	TRANSISTOR,SILICON 2SA933STP(R,S)
Q4023	TP7TC05001	COMPOUND TRANSISTOR DTA124EKT147
Q4024	TP7TC05001	COMPOUND TRANSISTOR DTA124EKT147
Q4025	TN7TJ05001	COMPOUND TRANSISTOR DTC114TKT147
Q4027	TN7TC05001	COMPOUND TRANSISTOR DTC124EKT147
Q4301	TN7TC05001	COMPOUND TRANSISTOR DTC124EKT147
Q4302	TN7TC05001	COMPOUND TRANSISTOR DTC124EKT147
Q4303	T67A1037K0	TRANSISTOR,SILICON 2SA1037KT147
Q4304	T87A2412K0	TRANSISTOR,SILICON 2SC2412KT147
Q4305	T67A1037K0	TRANSISTOR,SILICON 2SA1037KT147
Q4306	T87A2412K0	TRANSISTOR,SILICON 2SC2412KT147
Q4307	T67A1037K0	TRANSISTOR,SILICON 2SA1037KT147
Q4501	TN7TC05001	COMPOUND TRANSISTOR DTC124EKT147
Q4502	T77A013080	TRANSISTOR,SILICON 2SB1308T101
Q4503	T77A011320	TRANSISTOR,SILICON 2SB1132T101
Q4504	TN7TC05001	COMPOUND TRANSISTOR DTC124EKT147
Q4505	TN7TC05001	COMPOUND TRANSISTOR DTC124EKT147
Q4512	T93A018030	TRANSISTOR,SILICON 2SD1803-TL
Q4513	T93A018030	TRANSISTOR,SILICON 2SD1803-TL
Q4514	T67A1037K0	TRANSISTOR,SILICON 2SA1037KT147
Q5001	TC1T013170	TRANSISTOR,SILICON 2SC1317-T
Q5002	TN7TC05001	COMPOUND TRANSISTOR DTC124EKT147
Q6001	T67A1037K0	TRANSISTOR,SILICON 2SA1037KT147
Q6003	T82A037340	TRANSISTOR,SILICON 2SC3734
Q6004	TN7TC05001	COMPOUND TRANSISTOR DTC124EKT147
Q6005	T83A028140	TRANSISTOR,SILICON 2SC2814-T
Q7001	T67A1037K0	TRANSISTOR,SILICON 2SA1037KT147
Q7002	T87A2412K0	TRANSISTOR,SILICON 2SC2412KT147
Q7003	T87A2412K0	TRANSISTOR,SILICON 2SC2412KT147
Q7004	T87A2412K0	TRANSISTOR,SILICON 2SC2412KT147
Q7005	T87A2412K0	TRANSISTOR,SILICON 2SC2412KT147
Q7006	T87A2412K0	TRANSISTOR,SILICON 2SC2412KT147
Q7007	T87A2412KS	TRANSISTOR,SILICON 2SC2412KT147
Q7009	T87A040970	TRANSISTOR,SILICON 2SC4097T107
Q7010	T67A1036K0	TRANSISTOR,SILICON 2SA1036KT147
Q7011	T87A2412K0	TRANSISTOR,SILICON 2SC2412KT147
Q7012	TN7TC05001	COMPOUND TRANSISTOR DTC124EKT147
Q7013	T87A2412KS	TRANSISTOR,SILICON 2SC2412KT147
Q7014	T67A1037KS	TRANSISTOR,SILICON 2SA1037KT147
Q7018	TN7TC05001	COMPOUND TRANSISTOR DTC124EKT147
Q7019	T67A1037K0	TRANSISTOR,SILICON 2SA1037KT147
Q7023	TN7TC05001	COMPOUND TRANSISTOR DTC124EKT147
Q9003	TA2T018970	TRANSISTOR,SILICON 2SA1897
Q9004	T87A2412K0	TRANSISTOR,SILICON 2SC2412KT147
Q9005	TP7TB05001	COMPOUND TRANSISTOR DTA114EKT147
Q9006	TD3T007340	TRANSISTOR,SILICON 2SD734(E,F)-AA
⚠ Q9007	0002200490	PHOTO COUPLER PS2561-1-V
		COILS & TRANSFORMERS
L101	0216S1330J	COIL 33 UH
L351	021AM1220K	COIL 22 UH
L352	021AM1220K	COIL 22 UH
L502	021W02101L	COIL,CHOKE 100 UH
L503	021W02101L	COIL,CHOKE 100 UH
L504	021W0D221L	COIL,CHOKE 220 UH
L505	021W0D221L	COIL,CHOKE 220 UH
L4001	02167D101K	COIL 100 UH
L4002	021JA6150K	COIL 15 UH
L4003	021JA6121K	COIL 120 UH
L4004	021JA6271K	COIL 270 UH
L4005	021JA6151K	COIL 150 UH
L4006	021JA6470K	COIL 47 UH
L4007	021JA6100K	COIL 10 UH
L4010	021JA6271K	COIL 270 UH
L4011	021JA6220K	COIL 22 UH
L4012	021JA6271K	COIL 270 UH
L4013	021JA6220K	COIL 22 UH
L4014	02167D101K	COIL 100 UH
L4015	02167D101K	COIL 100 UH
L4017	021JA68R2K	COIL 8.2 UH
L4020	021JA6100K	COIL 10 UH
L4021	021673101J	COIL 100 UH
L4023	021673101J	COIL 100 UH
L4024	021673101J	COIL 100 UH
L4101	021673101K	COIL 100 UH
L4301	021AM1101K	COIL 100 UH
L4302	021AM1101K	COIL 100 UH
L4303	021AS1220K	COIL 22 UH
L4304	021AS1220K	COIL 22 UH

REF.NO.	PART NO.	DESCRIPTION
		COILS & TRANSFORMERS (CONT.)
L4305	021AS1100K	COIL 10 UH
L4501	0218M8330M	COIL 33 UH
L4502	0218M8330M	COIL 33 UH
L4503	0218M9101M	COIL 100 UH
L4504	021AM1101K	COIL 100 UH
L4505	021AM1470K	COIL 47 UH
L4506	021AM1101K	COIL 100 UH
L4507	0218M9101M	COIL 100 UH
L5001	021673102K	COIL 1000 UH
L5002	02167D562K	COIL 5.6 MH
L5003	02167D102K	COIL 1 MH
L5004	02167D562K	COIL 5.6 MH
L6001	021AM1101K	COIL 100 UH
L6002	021AM1101K	COIL 100 UH
L6003	03370MS01R	COIL,VIDEO IFT 374MS01
L6005	0216S11R2J	COIL 1.2 UH
L6006	033700003R	COIL,VIDEO IFT 3700003
L6008	021AM1101K	COIL 100 UH
L6010	0216S1150J	COIL 15 UH
L6013	021673821K	COIL 820 UH
L6014	0216S1470J	COIL 47 UH
L6015	021673101K	COIL 100 UH
L7001	021AM1470K	COIL 47 UH
L7002	0216S1120J	COIL 12 UH
L7003	021AM1331K	COIL 330 UH
L7004	03372R002R	COIL,CHROMA 372R002
L7005	03372RS01R	COIL,CHROMA 372RS01
L7006	021AS1330K	COIL 33 UH
L7008	021AM1101K	COIL 100 UH
⚠ L9001	029X000071	COIL,LINE FELTER SS10V-04220
L9005	021W66100M	COIL,CHOKE 10 UH
⚠ T4501	048103026J	TRANSFORMER,SWITCHING 8103026
⚠ T4502	048126001B	TRANSFORMER,SWITCHING 8126001B
T5001	033626010R	COIL,BIAS OSC 3626010
⚠ T9001	0481280111	TRANSFORMER,SWITCHING 8128011
		JACKS
J351	0602131008	JACK,RCA PIN HSJ0913-01-140
⚠ J501	0602602001	JACK,DC HEC0470-01-630
J4301	0602400005	JACK,RCA PIN JPJ1157-010043
J4302	0602400005	JACK,RCA PIN JPJ1157-010043
⚠ J9001	0602602001	JACK,DC HEC0470-01-630
		SWITCHES
SW771	0504201T31	SWITCH,TACT SKHVBE069A
SW772	0504201T31	SWITCH,TACT SKHVBE069A
SW775	0504201T31	SWITCH,TACT SKHVBE069A
SW776	0504201T31	SWITCH,TACT SKHVBE069A
SW777	0504201T31	SWITCH,TACT SKHVBE069A
SW778	0504201T31	SWITCH,TACT SKHVBE069A
SW779	0504201T31	SWITCH,TACT SKHVBE069A
SW781	0504201T31	SWITCH,TACT SKHVBE069A
SW1001	0500A01026	PUSH LEVER SWITCH MPU10230MLB0
SW1002	0500A01026	PUSH LEVER SWITCH MPU10230MLB0
SW9001	0504201T31	SWITCH,TACT SKHVBE075B
		VARIABLE RESISTORS
VR7003	V1263Q3BT6	VOLUME,SEMI FIXED RH0638CS3R02A
VR7004	V1263H4BT6	VOLUME,SEMI FIXED RH0638CJ4R02A
VR7005	V1263H4BT6	VOLUME,SEMI FIXED RH0638CJ4R02A
VR7007	V1263Q4BT6	VOLUME,SEMI FIXED RH0638CS4R02A
VR7008	V126314BT6	VOLUME,SEMI FIXED RH0638C14R02A
		P.C. BOARD ASSEMBLIES
PCB010	A53701A01A	PCB ASS'Y VM6115B
PCB030	A53701A03A	PCB ASS'Y VE6774B
PCB240	A53701A24A	PCB ASS'Y TM7386A
PCB330	A53102A33A	PCB ASS'Y VE5686B
PCB340	A53701A34A	PCB ASS'Y VE6776B
PCB390	A53701A39A	PCB ASS'Y TE6909C
PCB570	A51101A570	PCB ASS'Y VE4662B
		MISCELLANEOUS
AD001	0624000005	PLUG WEV2020-9001R
ANT001	125C008001	ANTENNA,ROD T4-216A
B501	024DT03583	CORE,BEADS LFP3A-M3A0TC
B502	024DT03583	CORE,BEADS LFP3A-M3A0TC
BT601	1412004008	BATTERY,MANGAN R03(AB)E 20 T
BT602	141K300069	BATTERY,NICAD OB-25
B1001	024DT03583	CORE,BEADS LFP3A-M3A0TC
B4501	024AC45006	CHIP SOLID INDUCTOR BLM41A800SPT
B9004	024DT03583	CORE,BEADS LFP3A-M3A0TC
CD001	121B164102	CORD,CAR BATTERY SI-PC107-69

REF.NO.	PART NO.	DESCRIPTION	
		MISCELLANEOUS (CONT.)	
	CD701	068122068A	CORD,EIS CONNECTOR 8122068A
	CP101	067R008019	WIRE HOLDER 51048-0800
	CP701	069X220509	CONNECTOR PCB SIDE S2B-PH-K-S
	CUS01	800JF00166	CUSHION-A
	CUS04	800JF00166	CUSHION-A
	CUS05	800JF00197	CUSHION-B
	CUS06	800JF00204	CUSHION-C
	CUS07	800JF00166	CUSHION-A
	CX701	06972E0549	CONNECTOR PCB SIDE TKC-W14X-C1
	CY701	06972EM010	CONNECTOR PCB SIDE TKC-W14P-B1
	CD1001	06812C069A	CORD,EIS CONNECTOR 812C069A
	CD1002	068128106B	CORD,EIS CONNECTOR 8128106B
	CD1003	06812C027A	CORD,EIS CONNECTOR 812C027A
	CD1004	068124052A	CORD,EIS CONNECTOR 8124052A
	CD2401	068101420A	CORD,EIS CONNECTOR 8101420A
	CD7001	122B002001	CORD,JUMPER 2B002001
⚠	CD9001	1206555801	CORD,AC BUSH 06555801
	CD9002	06C5TB0002	CORD,CONNECTOR C5TB0002
	CF6001	1012A5R511	FILTER,CERAMIC SFSL5.5MCB
	CF6002	1027238R91	FILTER,SAW F-1044QS
	CF6003	1012A5R512	FILTER,CERAMIC TRAP TPSL5.5MB
	CP1001	06942C0139	CONNECTOR PCB SIDE 1-173979-2
	CP1002	0694280129	CONNECTOR PCB SIDE 173981-8
	CP1003	0697150310	CONNECTOR PCB SIDE TAS-X05X-D1
	CP1004	06942C0129	CONNECTOR PCB SIDE 1-173981-2
	CP1005	0694240129	CONNECTOR PCB SIDE 173981-4
	CP4101	069J740109	CONNECTOR PCB SIDE IMSA-9603S-04C I
	CP4102	069R750499	CONNECTOR PCB SIDE 52492-0520
	CP4103	0697FM0080	CONNECTOR PCB SIDE TMC-N22X-B1
	CP4502	069X32T01A	CONNECTOR PCB SIDE SM02(8.0)B-BHS-1
	CP7001	069RV00219	CONNECTOR PCB SIDE 52030-2410
	CY1002	06979K0040	CONNECTOR PCB SIDE TMC-N20P-E1
	CY4001	06979M0040	CONNECTOR PCB SIDE TMC-N22P-E1
	DL7001	104A14R43K	DELAY LINE GLASS ADL-CP944R
⚠	F9001	080PT02002	FUSE 218002
	FH9001	06710T0006	HOLDER,FUSE TP00351-51
	FH9002	06710T0006	HOLDER,FUSE TP00351-51
⚠	ICP501	0832C03001	MICRO FUSE CCV 3A
⚠	ICP503	0832C03001	MICRO FUSE CCV 3A
	NR1001	11024472T1	R,NETWORK RGLD4X472J-T21
	OS701	0779000012	REMOTE RECEIVER GP1U271R
	PT9001	126C000002	TERMINAL,PIN ST-0015
	PT9002	126C000002	TERMINAL,PIN ST-0015
⚠	RY501	0560120117	RELAY AJZ32717
	SP701	070J532009	SPEAKER AA0108L
	TM601	0766094140	TRANSMITTER SBER20105A
⚠	TU6001	0145601030	TUNER TELE4-055A
	V7001	0955106001	LCD TFD60W12
	X102	1001T8R004	CERAMIC,OSCILLATOR EFOEC8004T4
	X103	100C32R803	CRYSTAL DSVT-200 32.768KHZ
	X1001	100CA8R005	CRYSTAL HC-49/U-S 8.0MHZ
	X4001	1006A4R303	CRYSTAL HC-49/U 4.433619MHZ
	X7001	100CA4R404	CRYSTAL HC-49/U-S 4.433619MHZ
	X7002	1002F0R501	CERAMIC,OSCILLATOR CSB500FB9
	X9001	1001T4R006	CERAMIC,OSCILLATOR EFOEC4004T4

RESISTOR
RC.....CARBON RESISTOR

CAPACITORS
CC.....CERAMIC CAPACITOR
CE.....ALUMI ELECTROLYTIC CAPACITOR
CP.....POLYESTER CAPACITOR
CPP.....POLYPROPYLENE CAPACITOR
CPL.....PLASTIC CAPACITOR
CMP.....METAL POLYESTER CAPACITOR
CMPL.....METAL PLASTIC CAPACITOR
CMPP.....METAL POLYPROPYLENE CAPACITOR
CST.....STYROL CAPACITOR

NOTE: THE FOLLOWING PART(S) MAY BE SUBSTITUTED FOR PARTS INDICATED IN THE ELECTRICAL REPLACEMENT PARTS LIST (WITH THE SAME REF.NO.). THESE PARTS SHARE THE SAME ELECTRICAL CHARACTERISTICS AND OTHER ELEMENTS FOR COMMON USAGE. EITHER PART NUMBER MAY BE USED IN THIS UNIT.

	BASE		REPLACEMENT	
REF.NO.	PART NO.	DESCRIPTION	PART NO.	DESCRIPTION
B1001	024DT03583	LFP3A-M3A0TC	0246T03561	HF55BTL3-5X6B
B501	024DT03583	LFP3A-M3A0TC	0246T03561	HF55BTL3-5X6B
B502	024DT03583	LFP3A-M3A0TC	0246T03561	HF55BTL3-5X6B
B9004	024DT03583	LFP3A-M3A0TC	0246T03561	HF55BTL3-5X6B
D101	D28TEQS040	11EQS04TA1B2	D28TQS04N0	11EQS04N-TA1B2
D115	D28TEQS040	11EQS04TA1B2	D28TQS04N0	11EQS04N-TA1B2
D9018	D28T11DF20	11DF2-TA2B2	D28T11DFN2	11DF2N-TA2B2